

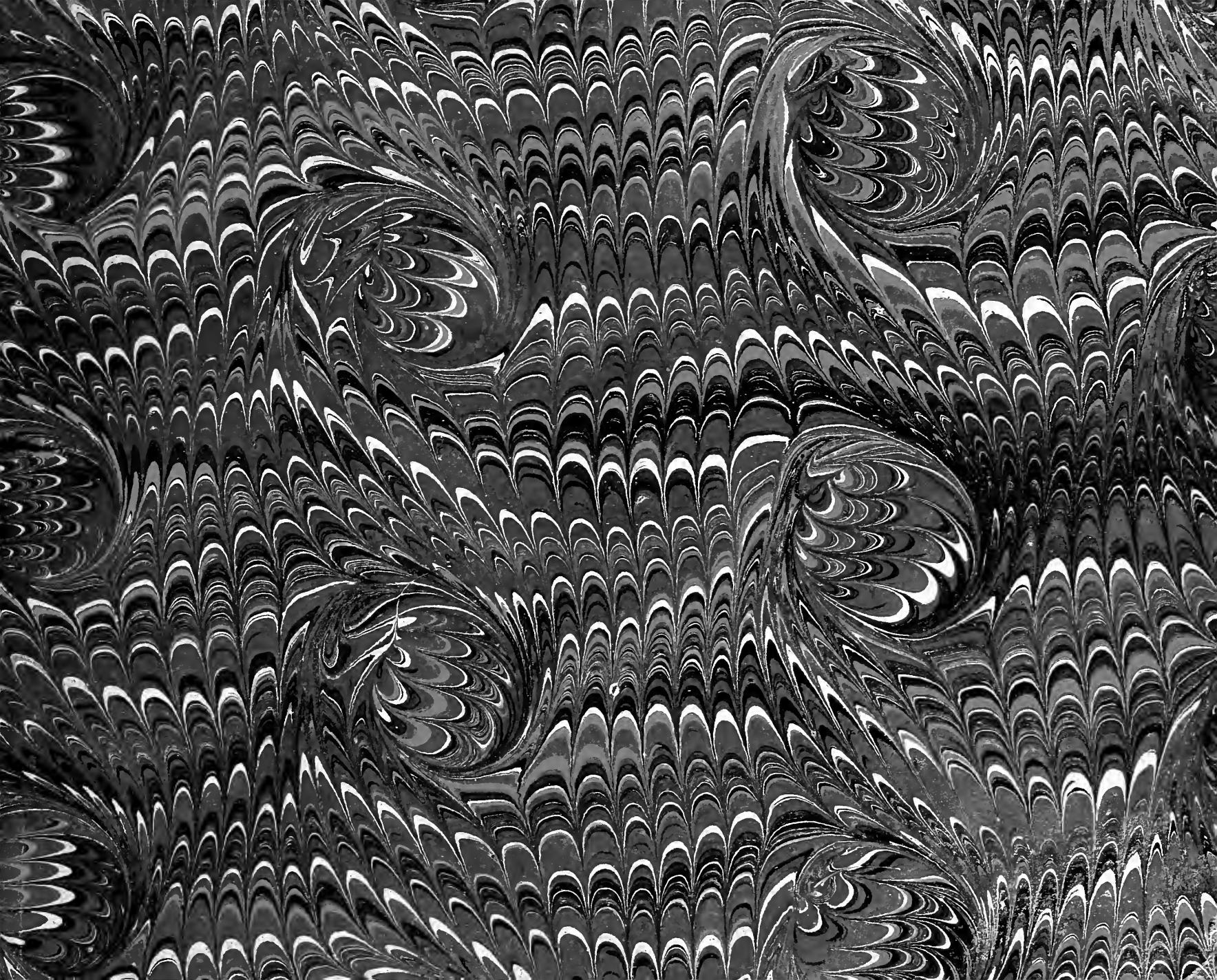


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Chap. <sup>352</sup> Copyright No. ....

Shel<sup>t</sup> 163

UNITED STATES OF AMERICA.





SAMPLES  
OF THE  
WORK IN DRAWING  
OF THE STUDENTS OF  
THE INTERNATIONAL CORRESPONDENCE SCHOOLS  
SCRANTON, PA.

---

MECHANICAL DRAWING

---

THE COLLIERY ENGINEER COMPANY  
SCRANTON, PA.

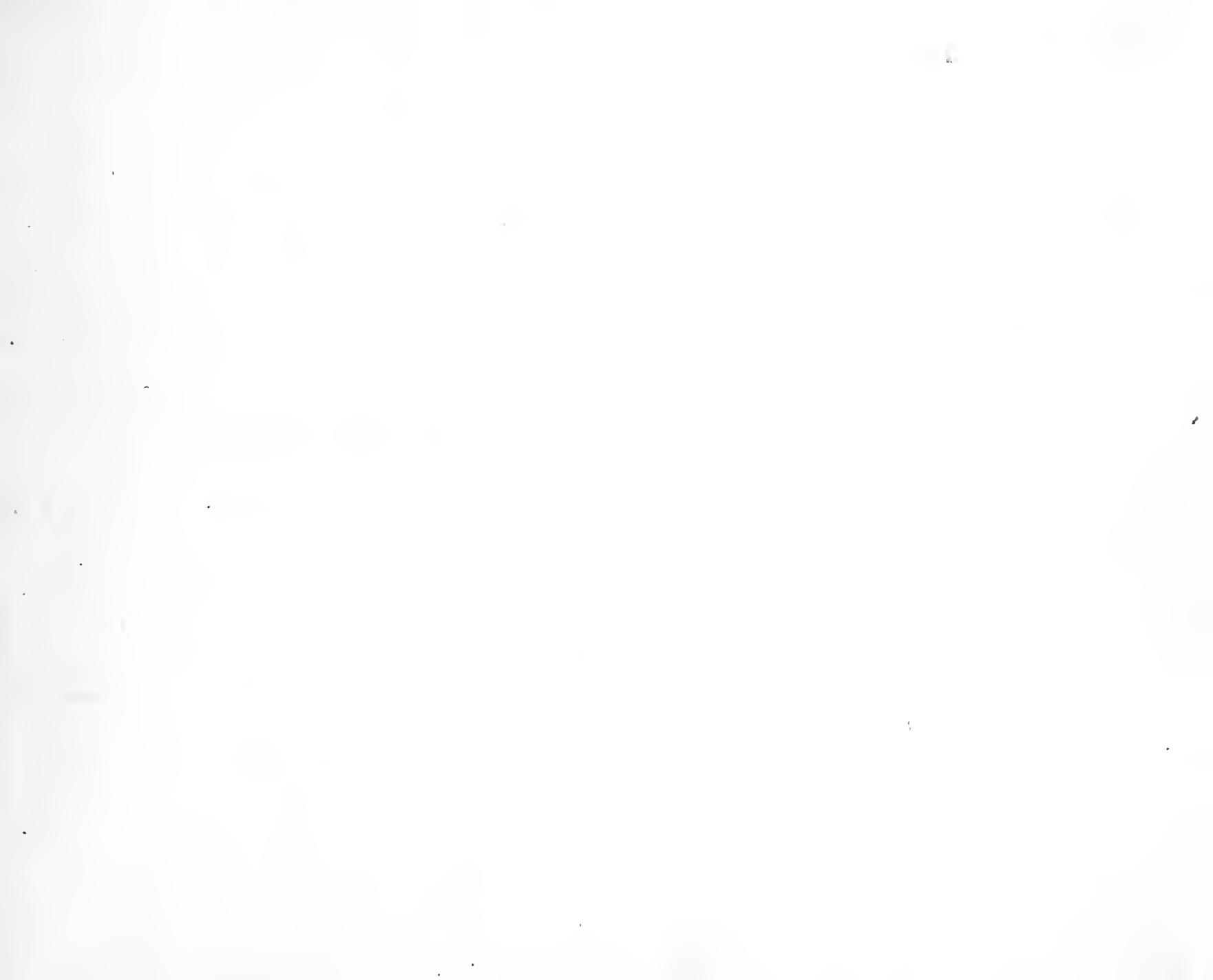


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186



PROBLEM 1: To bisect a straight line

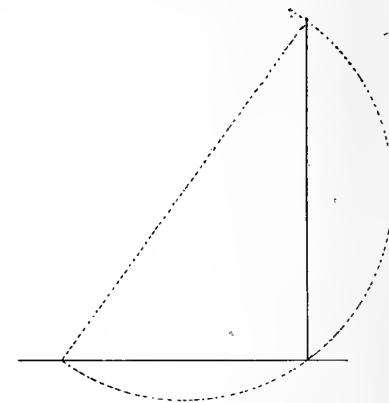
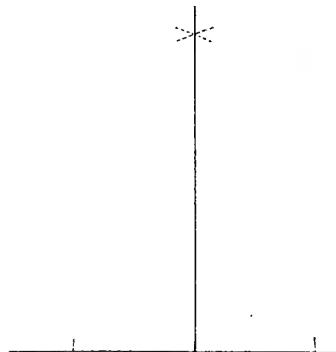
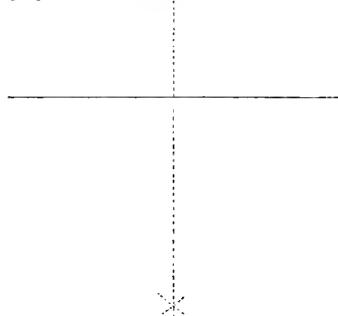
PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line.

CASE I

CASE II

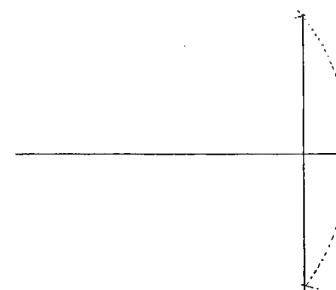
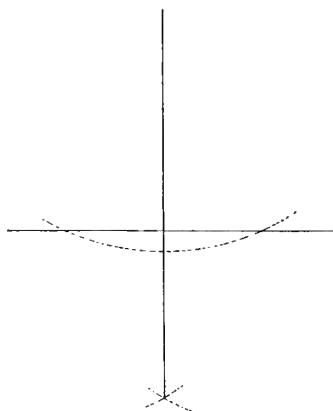
Photograph of Plate Drawn by

Vincent A. Clarke, Machinist, Age 29,  
 2705 Berks Street, Fairmont Station,  
 C. 587. PHILADELPHIA, PA.

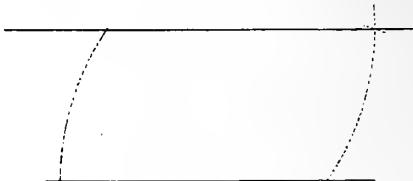


PROBLEM 3: To draw a perpendicular to a straight line from a point without it  
 CASE I

CASE II



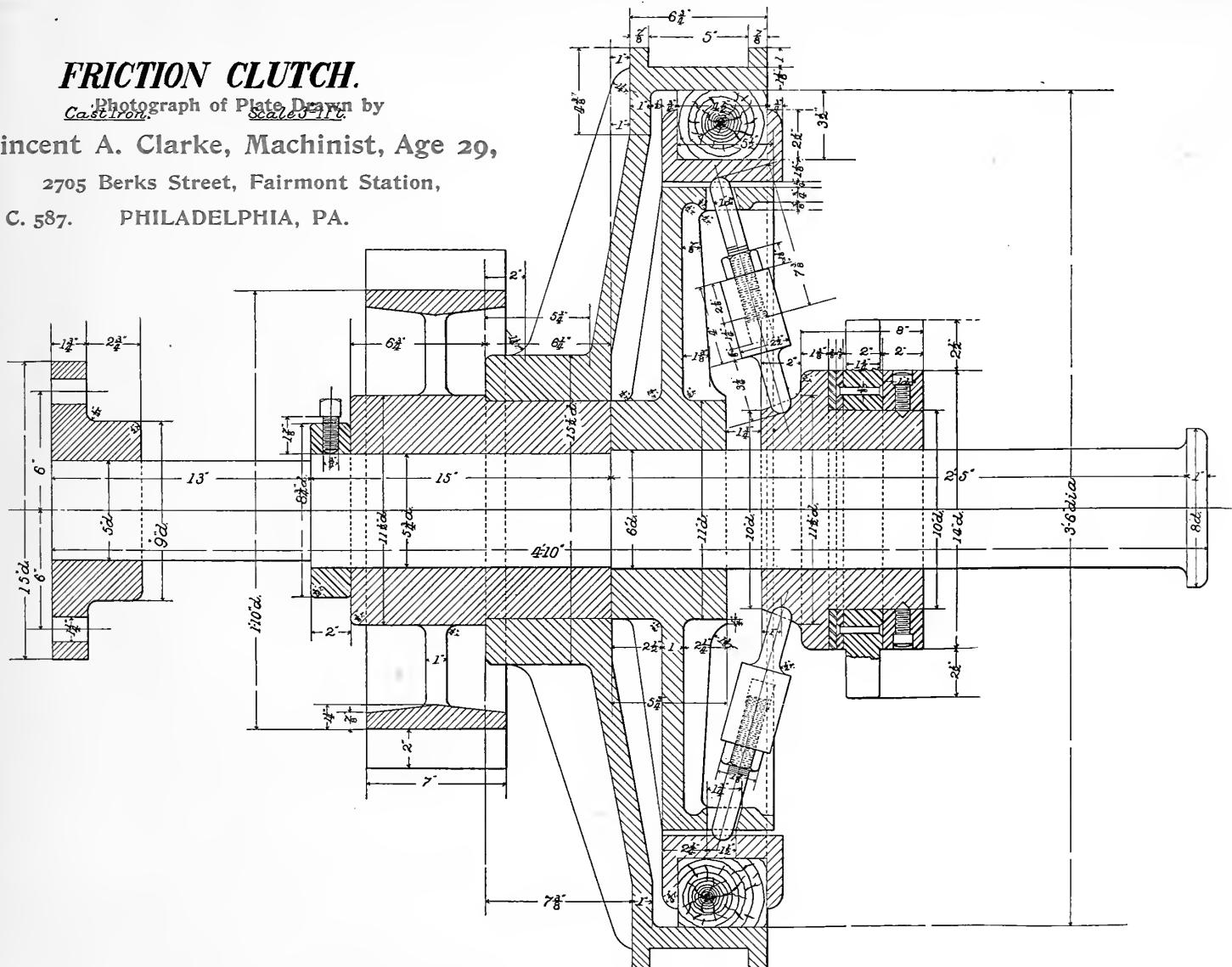
PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line



## *FRICITION CLUTCH.*

Photograph of Plate Drawn by  
Cast Iron. Scales 3 ft.

**Vincent A. Clarke, Machinist, Age 29,  
2705 Berks Street, Fairmont Station,  
C. 587. PHILADELPHIA, PA.**



OCT. 22, 1894.

VINCENT CLARKE CLASS N° C 587





PLATE I

PROBLEM 1: To Bisect a straight line.

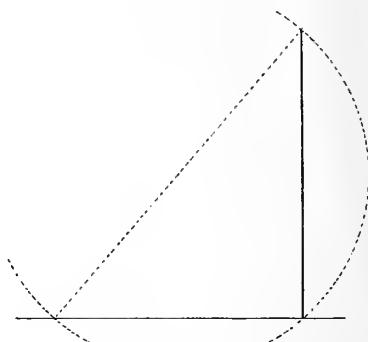
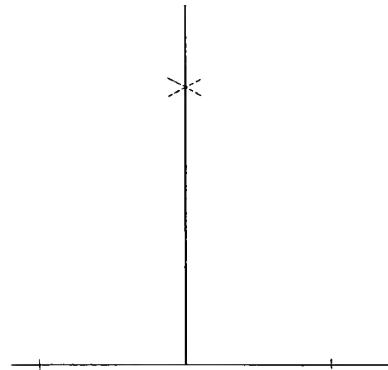
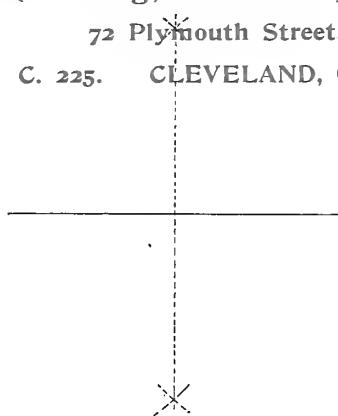
PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line.  
CASE 1

CASE 2

Photograph of Plate Drawn by

E. R. Young, Machinist, Age 25,

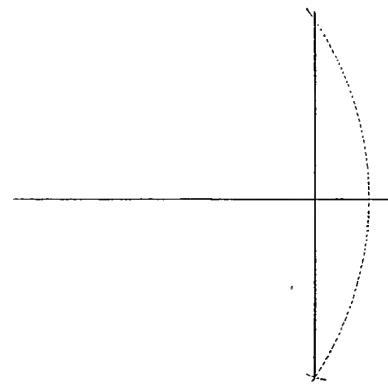
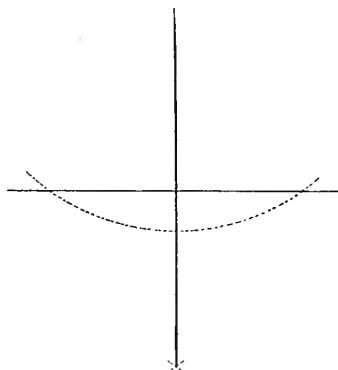
72 Plymouth Street,  
C. 225. CLEVELAND, OHIO.



PROBLEM 3: To draw a perpendicular to a straight line from a point without it

CASE 1

CASE 2



PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line



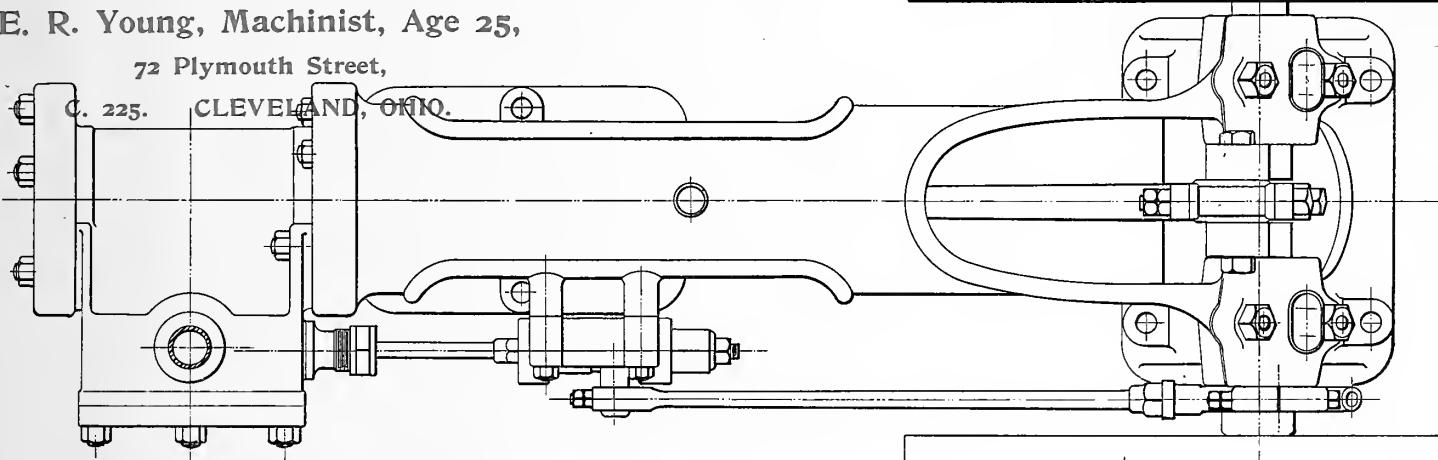
Photograph of Plate Drawn by

E. R. Young, Machinist, Age 25,

72 Plymouth Street,

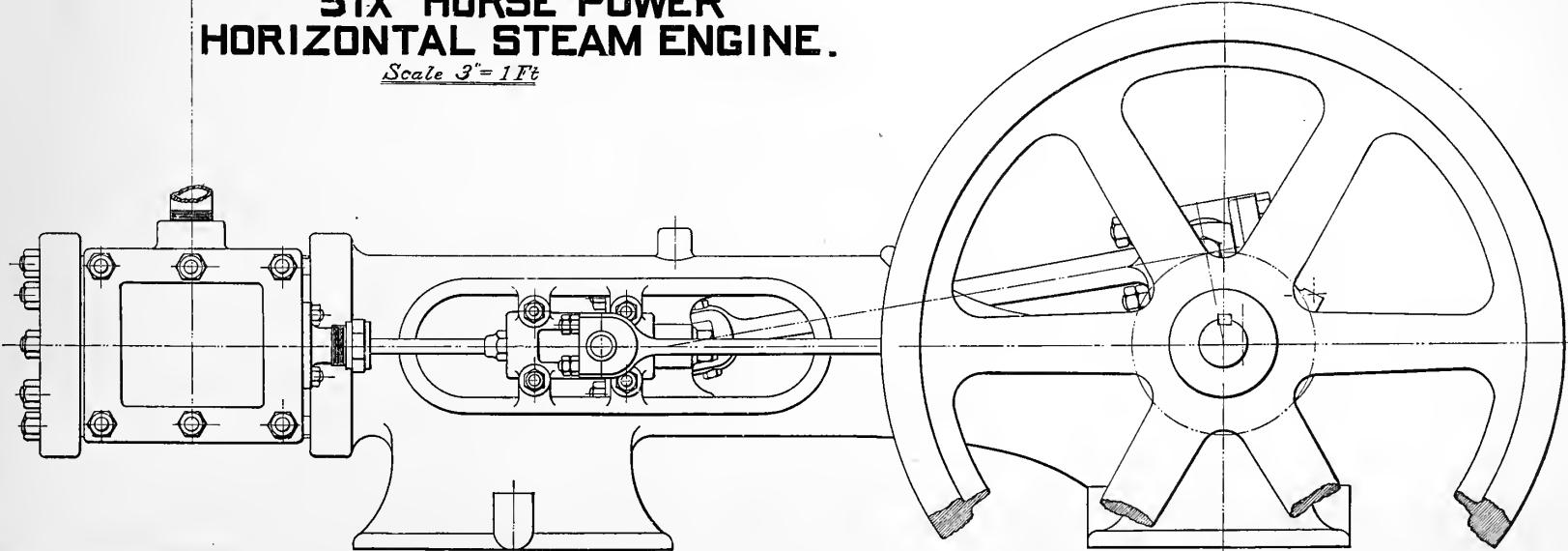
C. 225.

CLEVELAND, OHIO.



**SIX HORSE POWER  
HORIZONTAL STEAM ENGINE.**

Scale 3" = 1 Ft







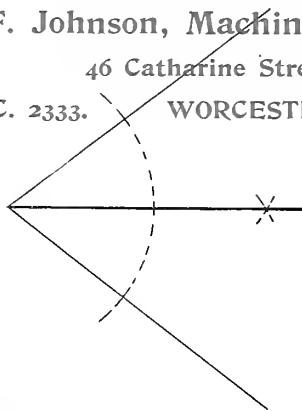
To bisect a given angle.  
CASE I.

Photograph of Plate Drawn by

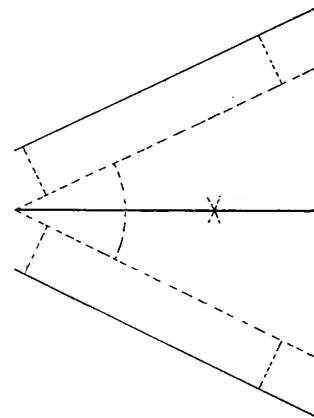
J. F. Johnson, Machinist, Age 28,

46 Catharine Street,

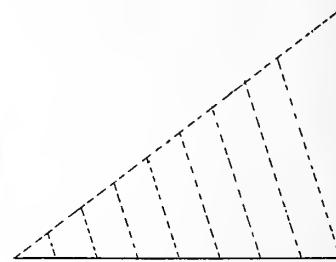
C. 2333. WORCESTER, MASS.



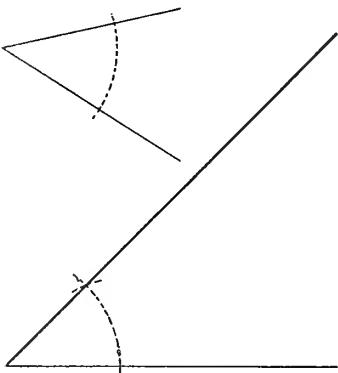
To bisect a given angle  
CASE II.



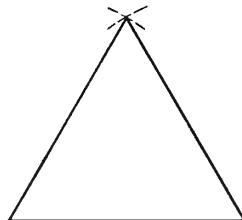
To divide a given straight line into any required number of equal parts.



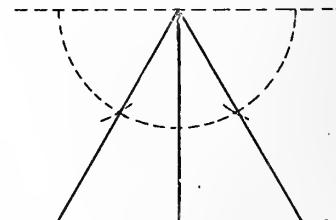
To draw a straight line through any given point on a given straight line to make any required angle with that line:



To draw an equilateral triangle, one side being given:



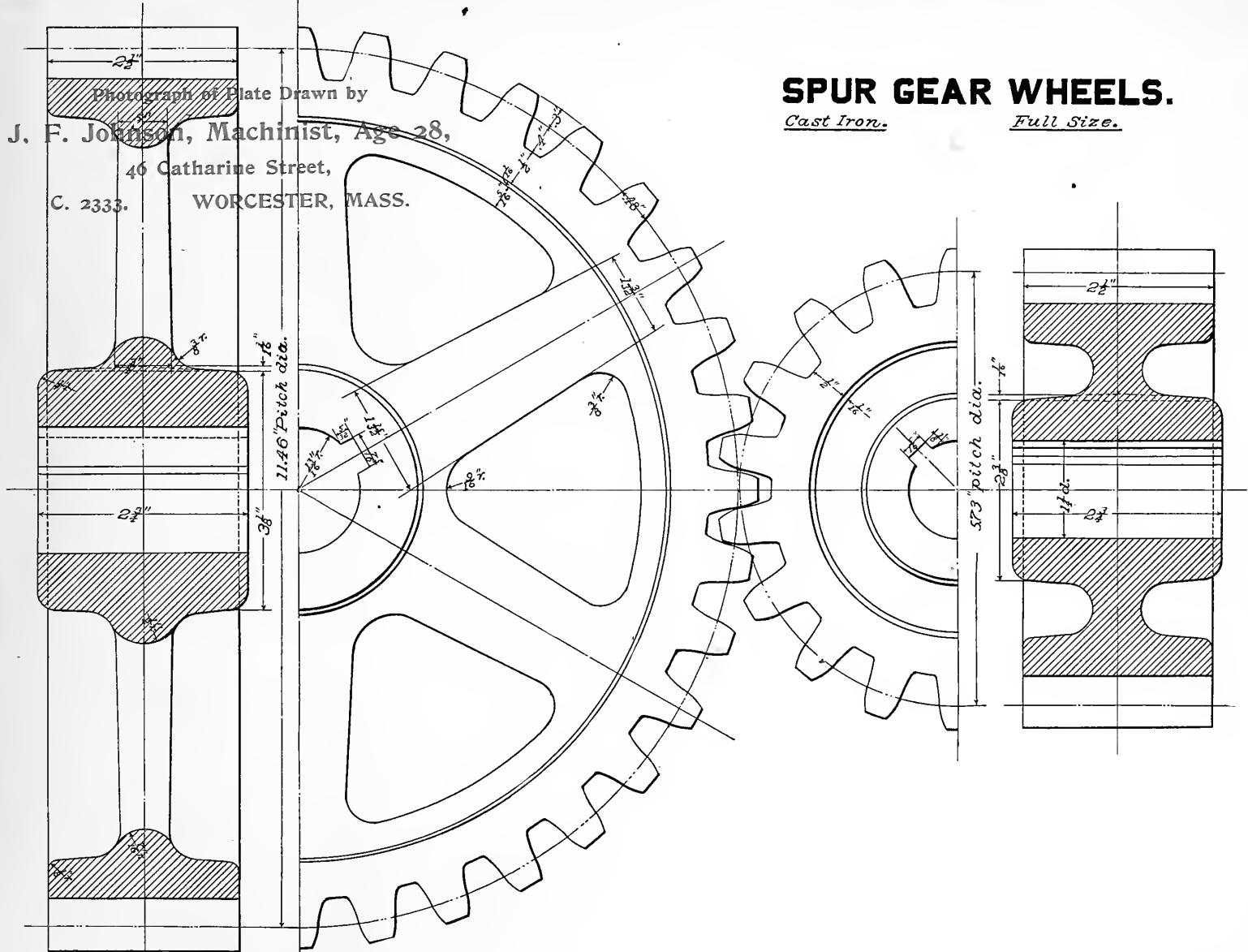
The altitude of an equilateral triangle being given, to draw the triangle:



## SPUR GEAR WHEELS.

Cast Iron.Full Size.

J. F. JOHNSON, Machinist, Age 28,  
46 Catharine Street,  
C. 2333. WORCESTER, MASS.







PROBLEM 5. To bisect a given angle  
CASE I.

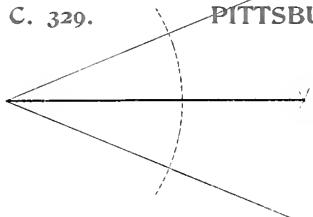
Photograph of Plate Drawn by

J. G. Phillips, Machinist, Age 29,

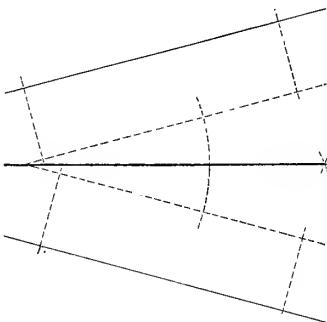
33 Eureka Street,

C. 329.

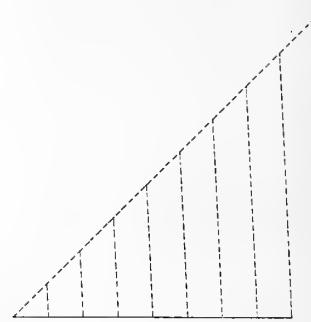
PITTSBURG, PA.



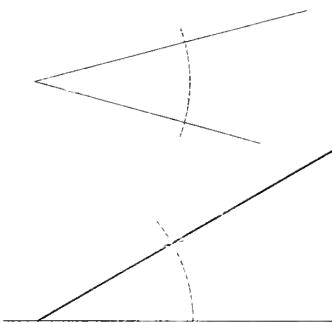
PROBLEM 5. To bisect a given angle  
CASE II.



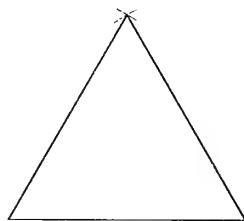
PROBLEM 6. To divide a given straight line into any required number of equal parts.



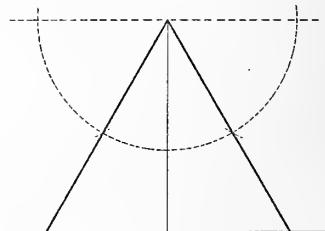
PROBLEM 7 To draw a straight line through any given point on a given straight line to make any required angle with that line.



PROBLEM 8. To draw an equilateral triangle one side being given.



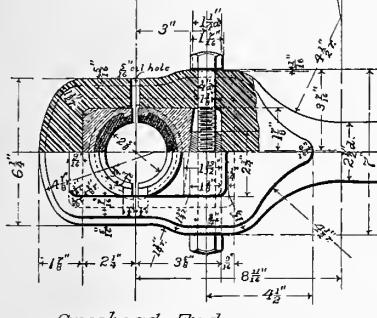
PROBLEM 9. The altitude of an equilateral triangle being given to draw the triangle.



## CONNECTING ROD.

Wrot. Iron. Brass Boxes Babbited.  
Scale 3 $\frac{1}{2}$  FT. Finished.

Photograph of Plate Drawn by  
G. Phillips, Machinist, Age 29,  
33 Eureka Street,  
C. 329. PITTSBURG, PA. 4' 3 $\frac{1}{2}$ "



Crosshead End.

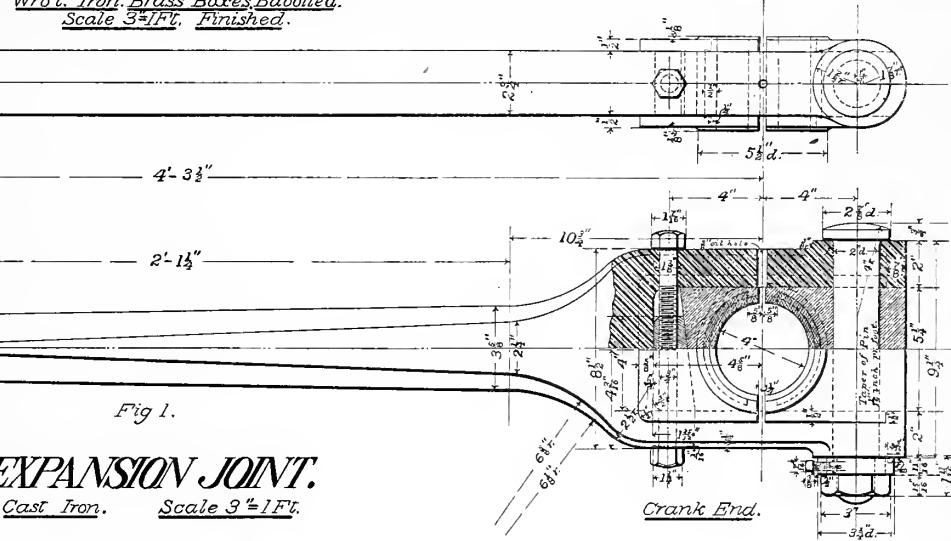


Fig 1.

## EXPANSION JOINT.

Cast Iron. Scale 3 $\frac{1}{2}$  FT.

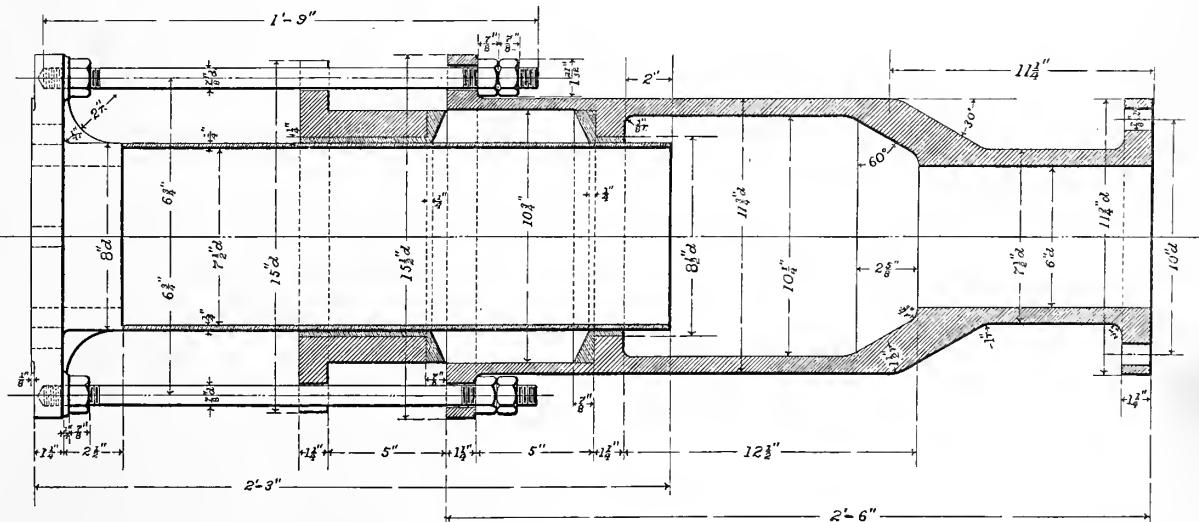
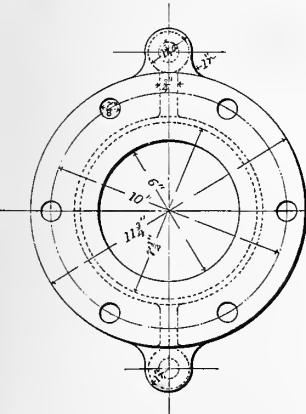


Fig 2.





PROBLEM 1: To bisect a straight line.

PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line.  
CASE I.  
CASE II.

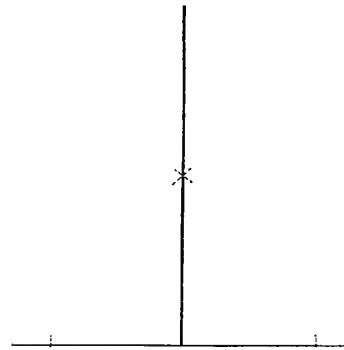
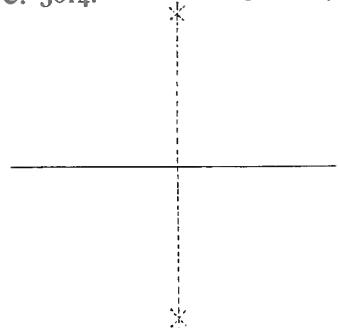
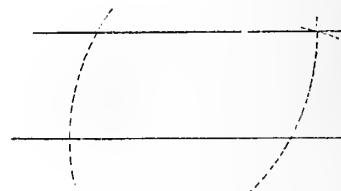
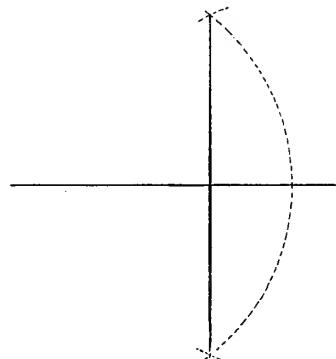
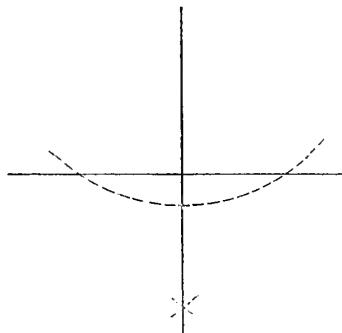
Photograph of Plate Drawn by

John Edgar, Asst. Millwright, Age 17,

BOX 205, WINDSOR,

C. 3614.

ONTARIO, CANADA.

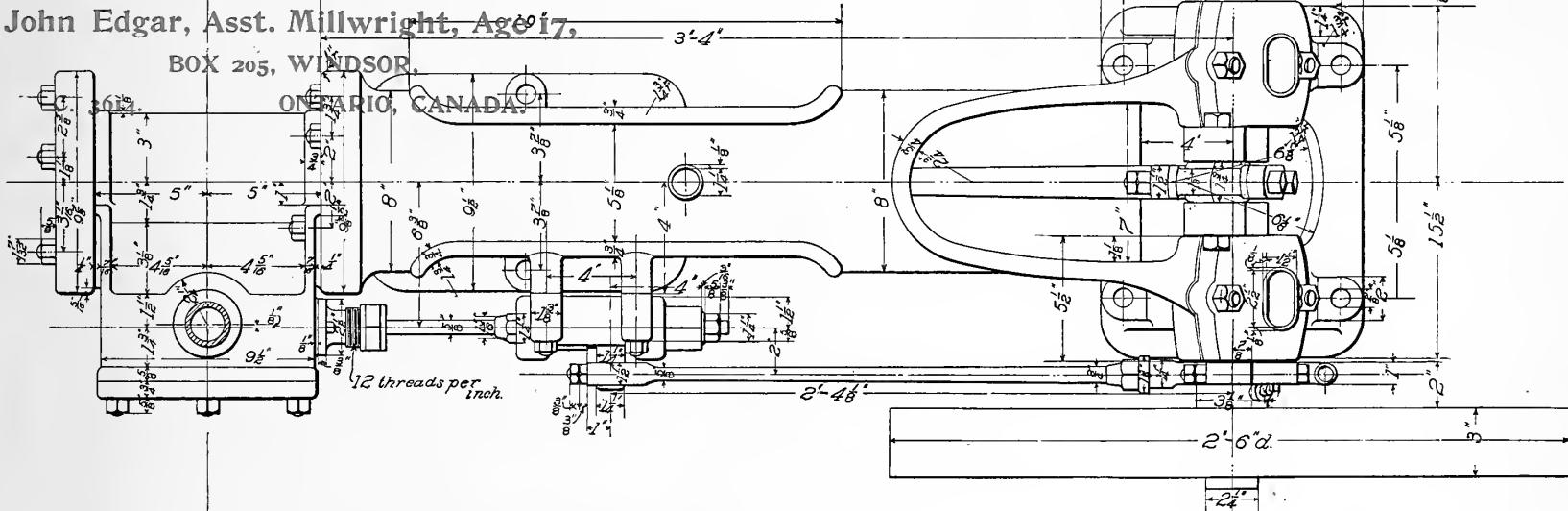
PROBLEM 3: To draw a perpendicular to a straight line from a without it.  
CASE I.CASE II.  
PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line.

Photograph of Plate Drawn by

John Edgar, Asst. Millwright, Age 17,

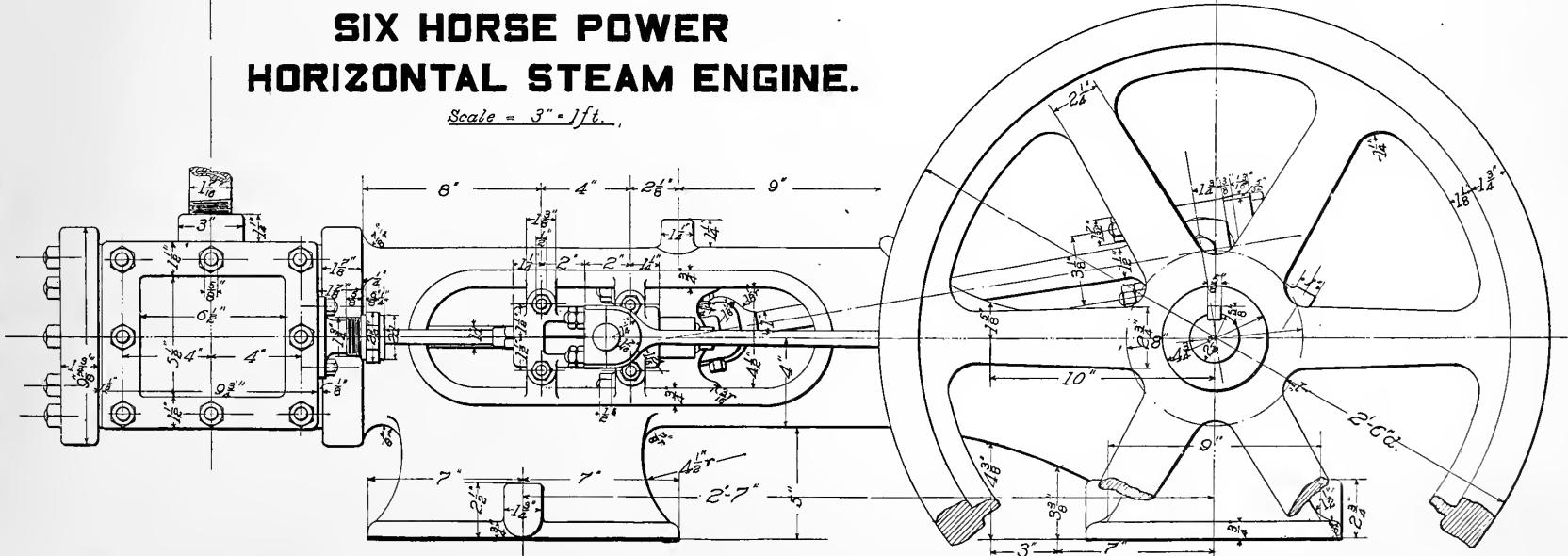
BOX 205, WINDSOR.

ONTARIO, CANADA.



## SIX HORSE POWER HORIZONTAL STEAM ENGINE.

Scale = 3" = 1 ft.







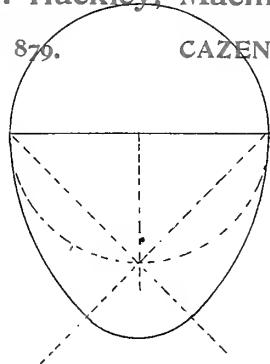
PROBLEM 22. To draw an egg shaped oval.

Photograph of Plate Drawn by

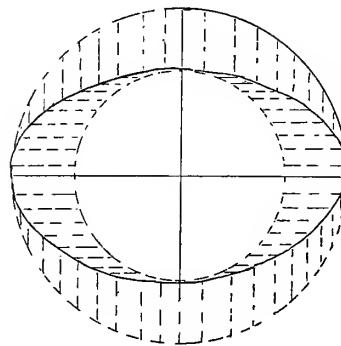
G. T. Hackley, Machinist, Age 16,

C. 879.

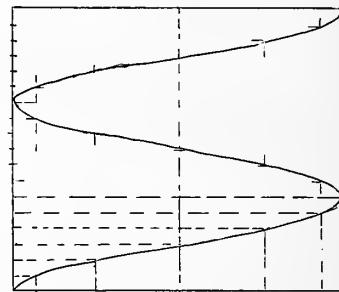
CAZENOVIA, N. Y.



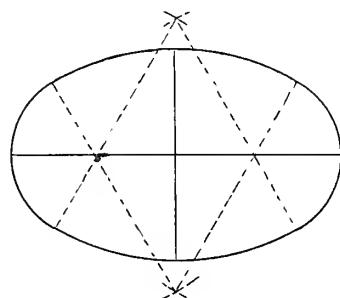
PROBLEM 23. To draw an ellipse the diameters being given.



PROBLEM 26. To draw a helix, the pitch and the diameter being given



PROBLEM 24. To draw an ellipse with circular arcs.



PROBLEM 25. To draw a parabola, the axis and longest double ordinate being given.

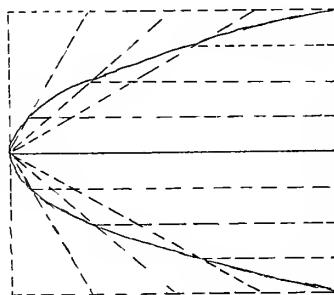
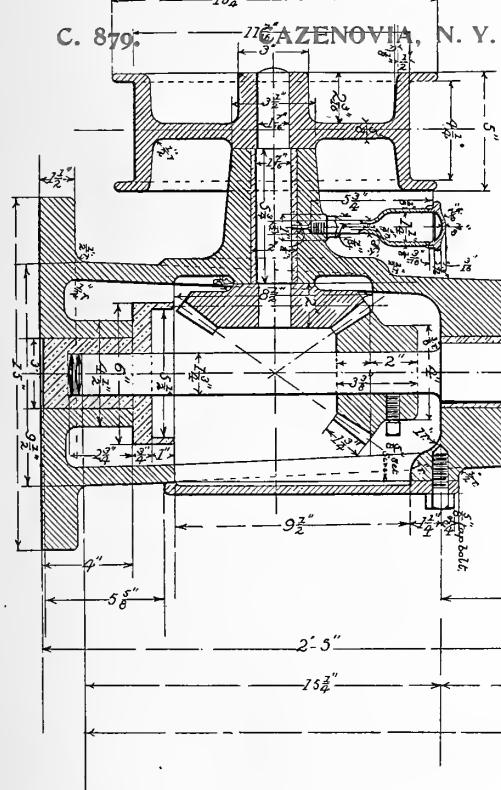


PLATE XXIV.

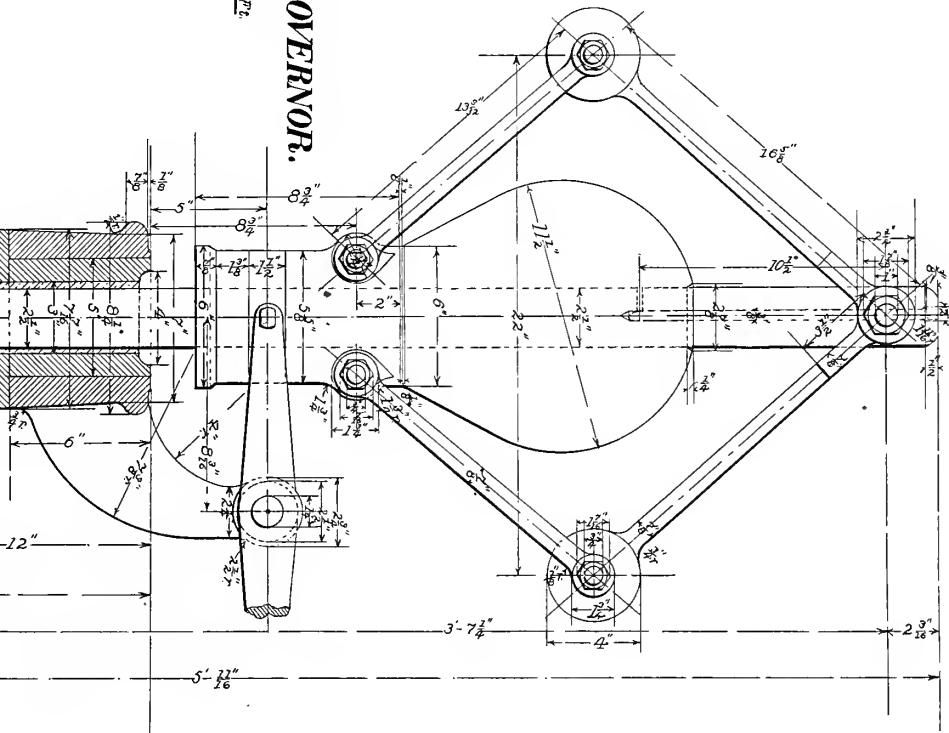
Photograph of Plate Drawn by

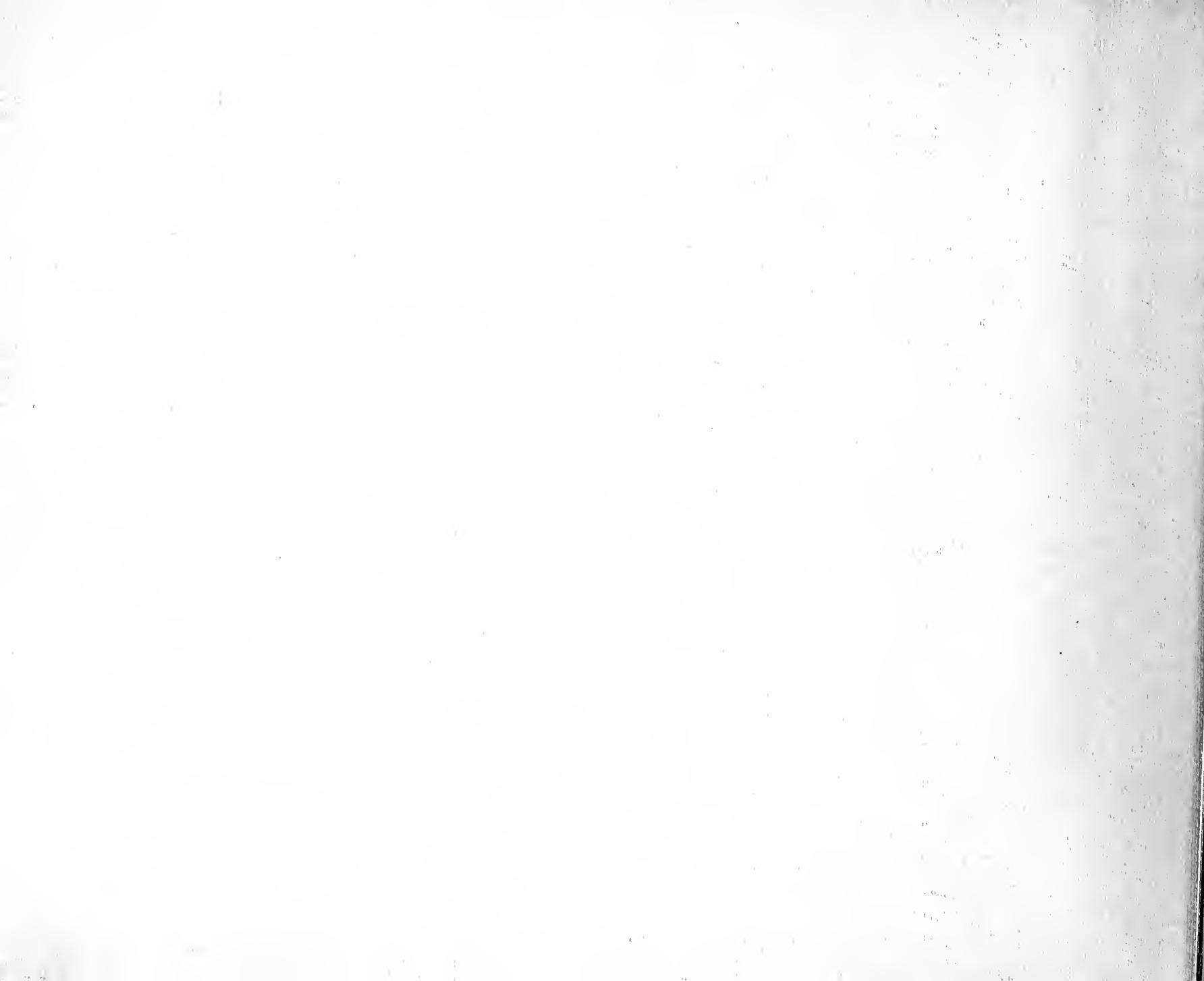
G. T. Hackley, Machinist, Age 16,

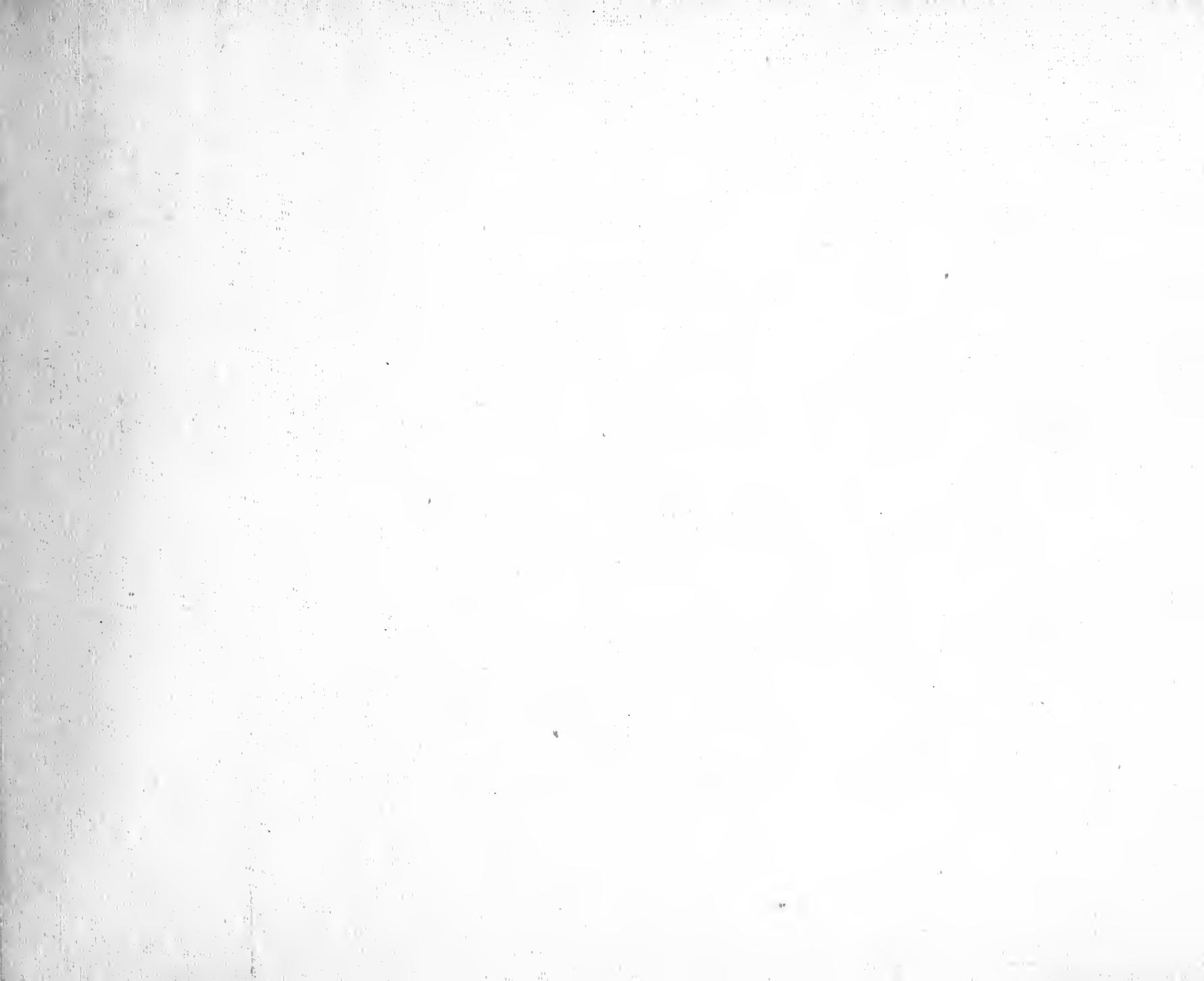


WEIGHTED GOVERNOR.

Scale 3" = 1 Ft.





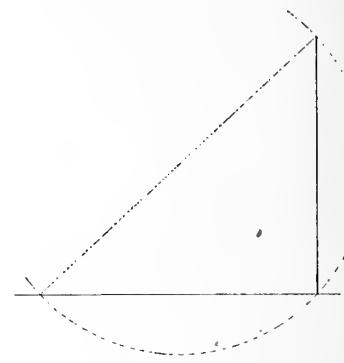
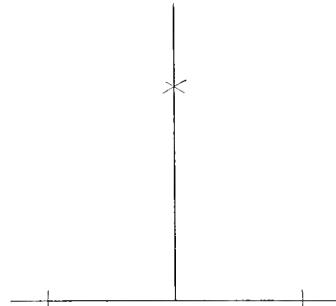
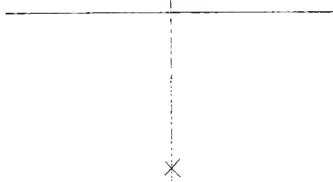


PROBLEM 1: To bisect a straight line

PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line  
CASE I. CASE II.

Photograph of Plate Drawn by

George Fouts, Carpenter, Age 30,  
520 Moxahala Avenue,  
C. 68. ZANESVILLE, OHIO.

PROBLEM 3: To draw a perpendicular to a straight line from a given point without it  
CASE I.

PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line

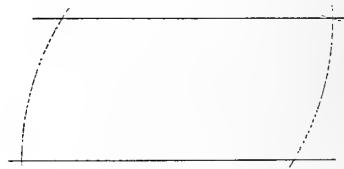
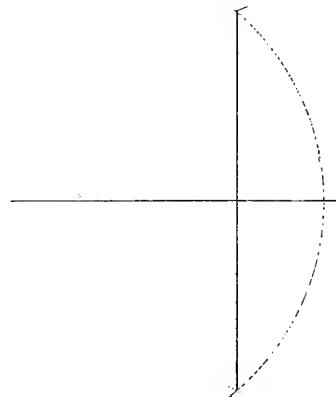
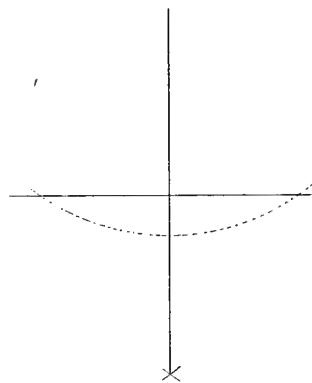








PLATE 1.

PROBLEM 1: To bisect a straight line.

PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line.  
CASE I.

CASE II.

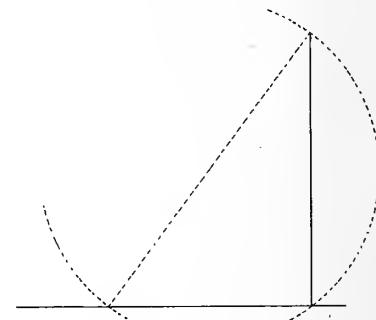
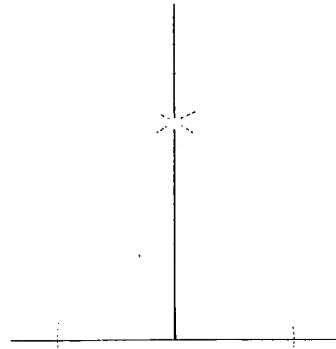
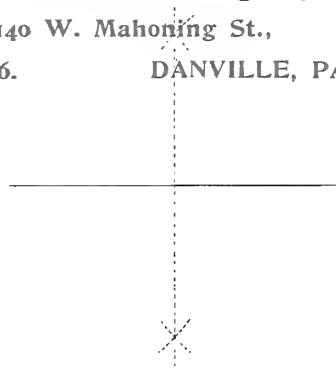
Photograph of Plate Drawn by

C. W. Johnson, Age 19,

140 W. Mahoning St.,

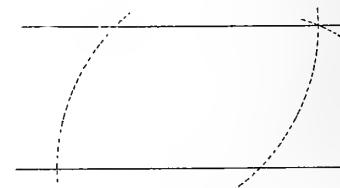
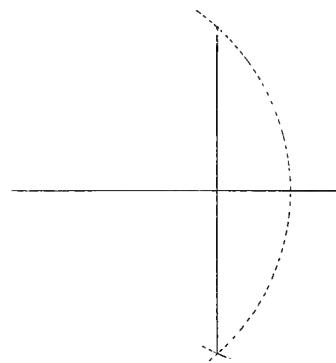
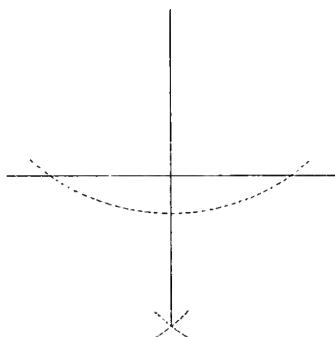
C. 2666.

DANVILLE, PA.



PROBLEM 3: To draw a perpendicular to a straight line from a point without it  
CASE I.

PROBLEM 4: Through a given point to draw  
a straight line parallel to a given straight line.



## BOILER SETTING.

Scale  $\frac{1}{4}$  = 1 FT.

Photograph of Plate Drawn by  
 C. W. Johnson, Age 19,  
 140 W. Mahoning St.,  
 DANVILLE, PA.

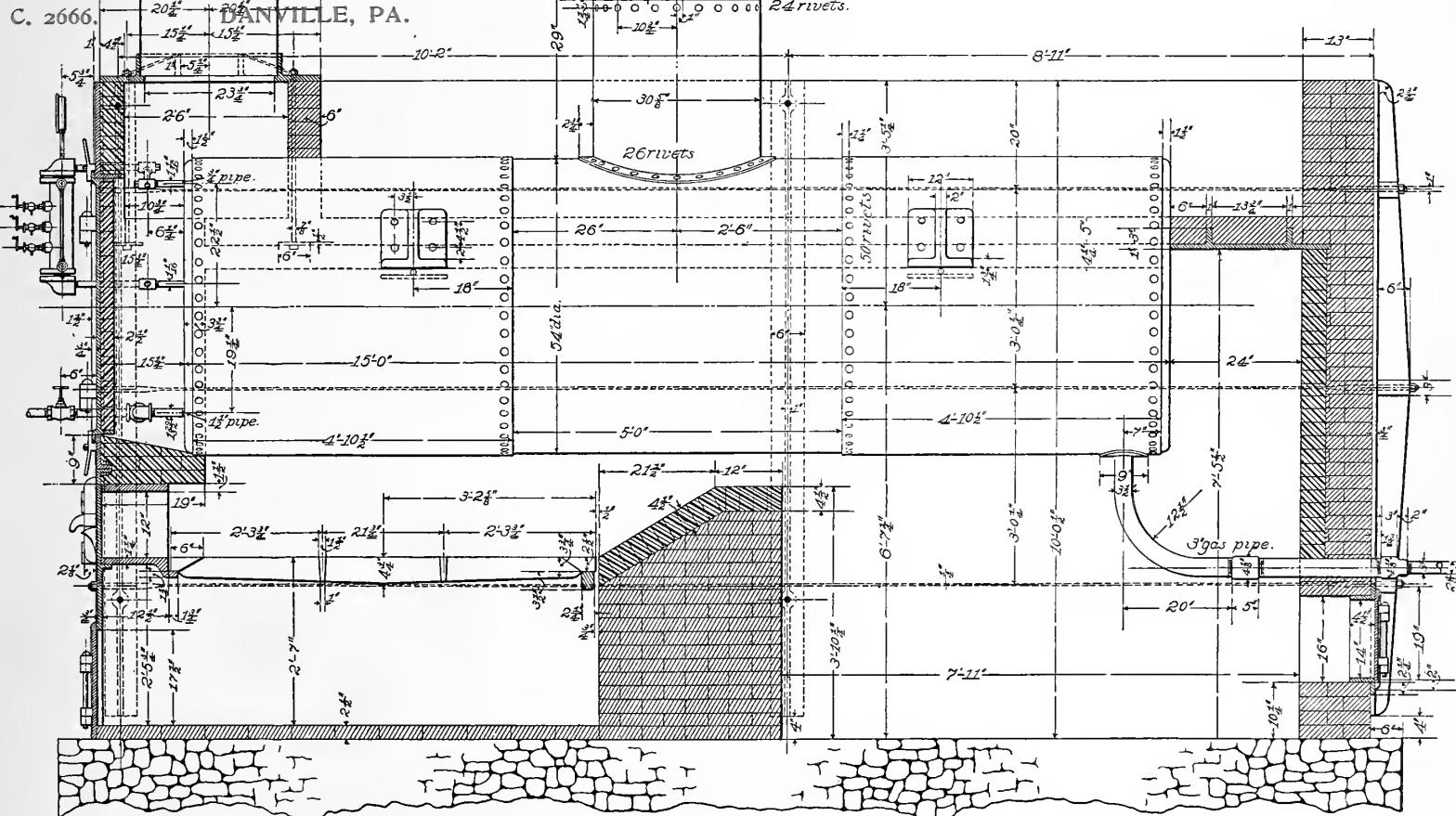






PLATE I

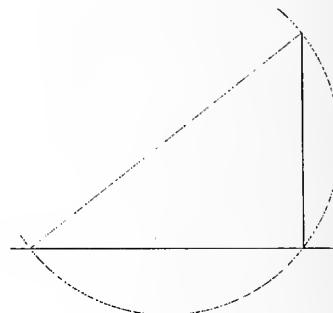
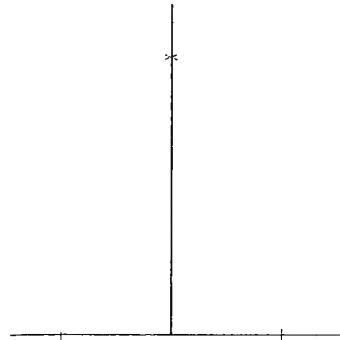
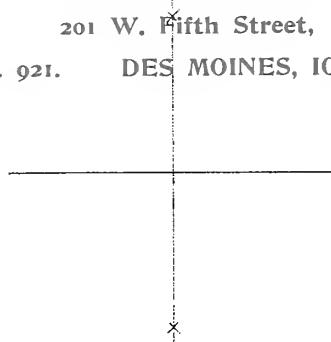
PROBLEM 1: To bisect a straight line.

PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line.

CASE I

CASE II

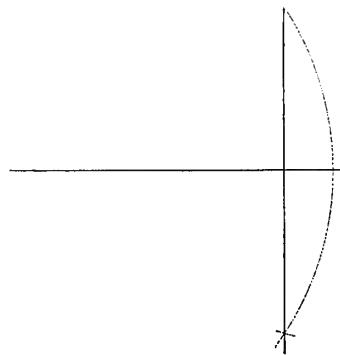
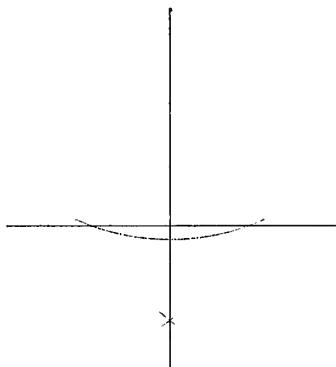
Photograph of Plate Drawn by  
James Barels, Printer, Age 24,  
201 W. Fifth Street,  
C. 921. DES MOINES, IOWA.



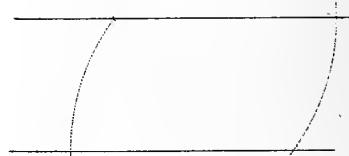
PROBLEM 3 To draw a perpendicular to a straight line from a point without it.

CASE I

CASE II



PROBLEM 4 Through a given point to draw a straight line parallel to a given straight line.



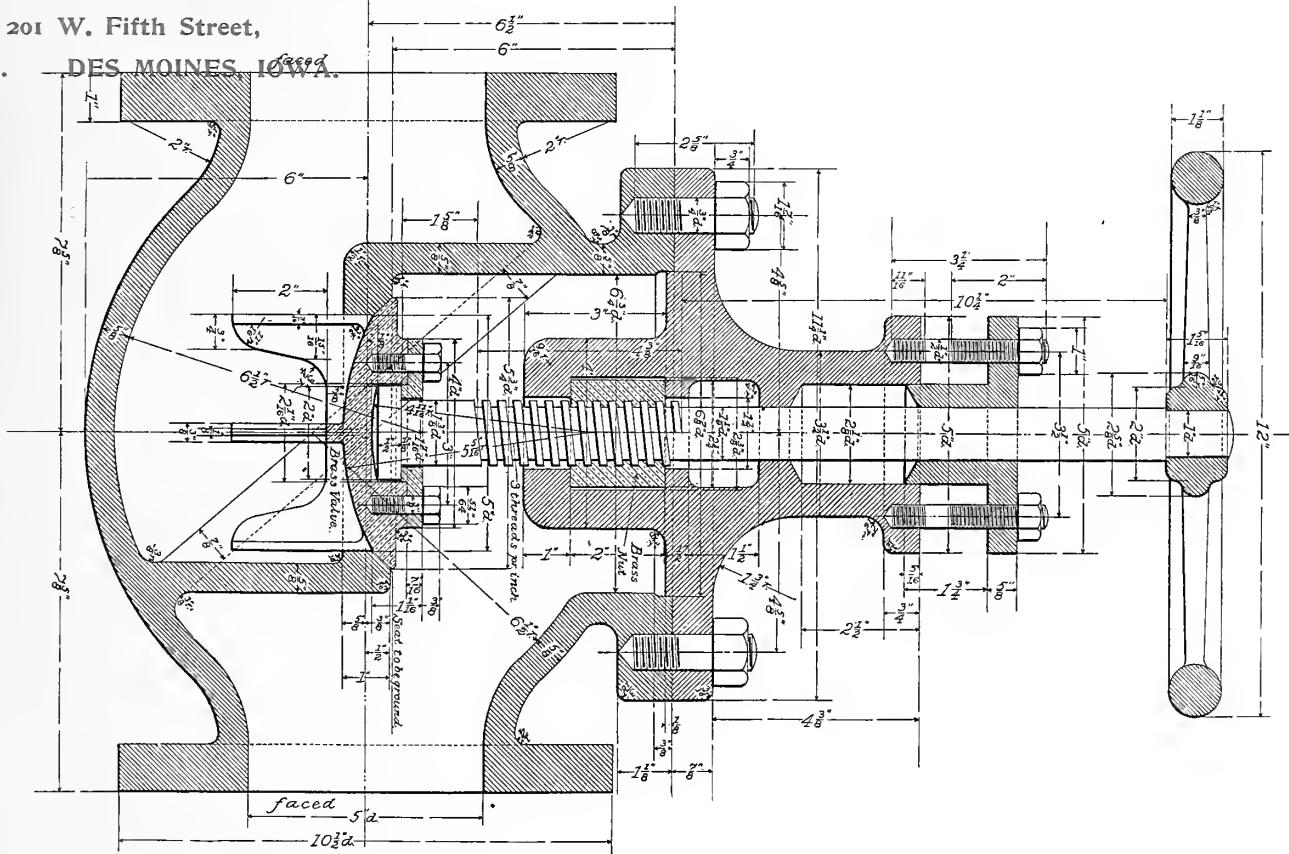
## PLATE XVII.

Photograph of Plate Drawn by  
**James Barels, Printer, Age 24,**

## 5 INCH GLOBE VALVE.

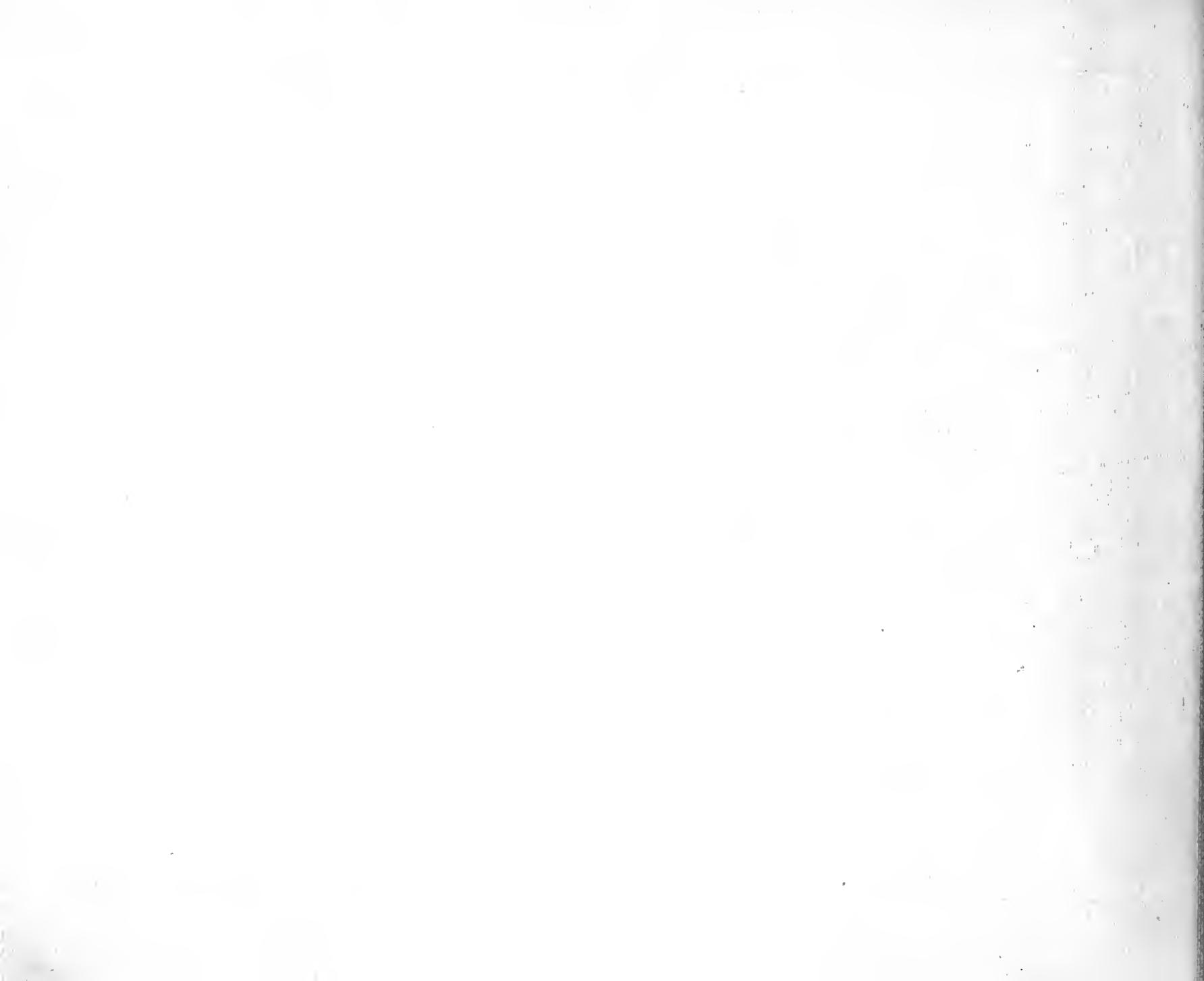
### Cast Iron

Half-Sizes



NOVEMBER 11, 1896.

JAMES BARELS, CLASS N<sup>o</sup> C 921.





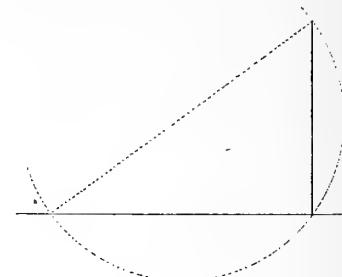
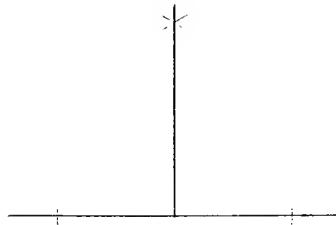
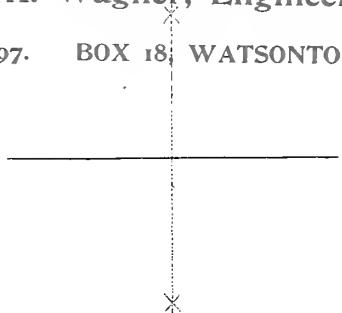
PROBLEM I: To bisect a given straight line

PROBLEM To draw a perpendicular to a straight line from a given point in that line.  
CASE I  
CASE II

Photograph of Plate Drawn by

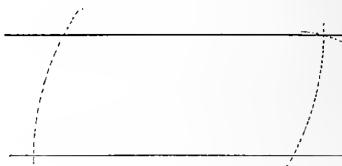
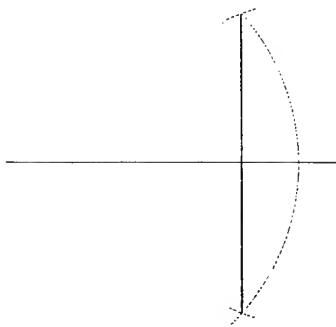
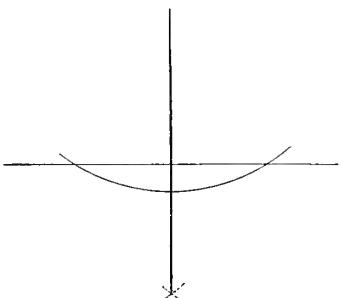
Geo. K. Wagner, Engineer, Age 22,

C. 97. BOX 18 WATSONTOWN, PA.



PROBLEM 3: To draw a perpendicular to a straight line from a given point without it,  
CASE I  
CASE II

PROBL 4 Through a given point to draw a straight line parallel to a given straight line



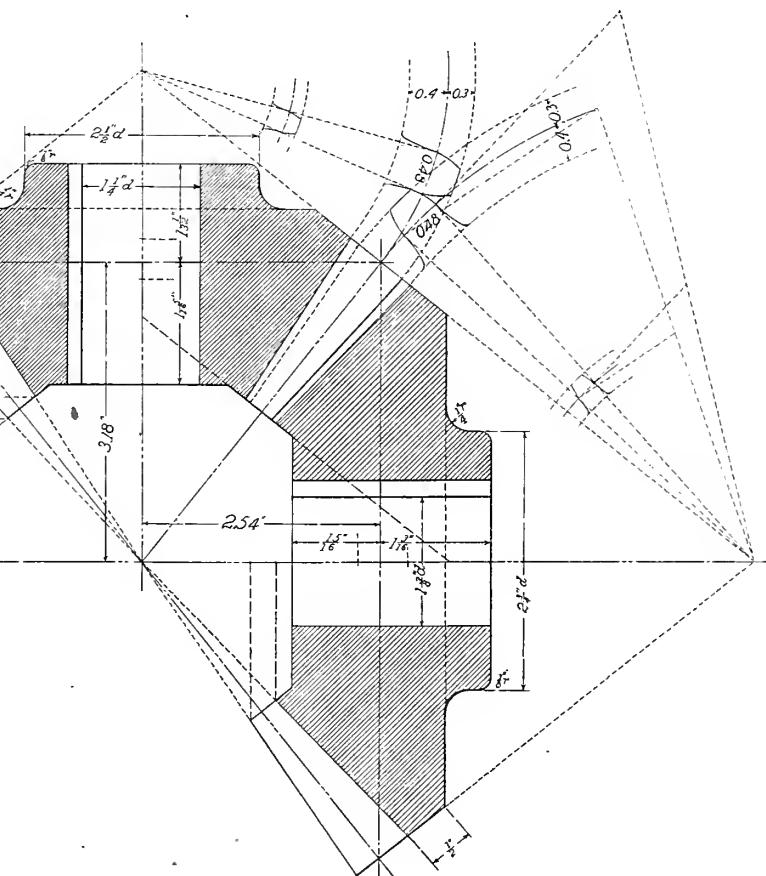
## PLATE XXI.

Large Wheel  
Pitch dia 6 3/8"  
Pitch 1 1/8"  
Photograph of Plate Drawn by  
20 teeth  
Geo. K. Wagner, Engineer, Age 22,  
Pinion  
Pitch dia 5 1/8"  
Pitch 1 1/8"  
16 teeth  
C. 67 BOX 18, WATSONTOWN, PA.

This technical drawing illustrates a large gear assembly. The main feature is a large gear with 20 teeth, shown in a front view. The gear has a central hole with a diameter of 6 3/8 inches and a pitch of 1 1/8 inches. Below the large gear, a smaller gear with 16 teeth (pitch dia 5 1/8", pitch 1 1/8") is shown in a side view, indicating its relationship to the larger gear. A plate is drawn between the two gears. The drawing is annotated with text and dimensions, including the engineer's name, age, and address.

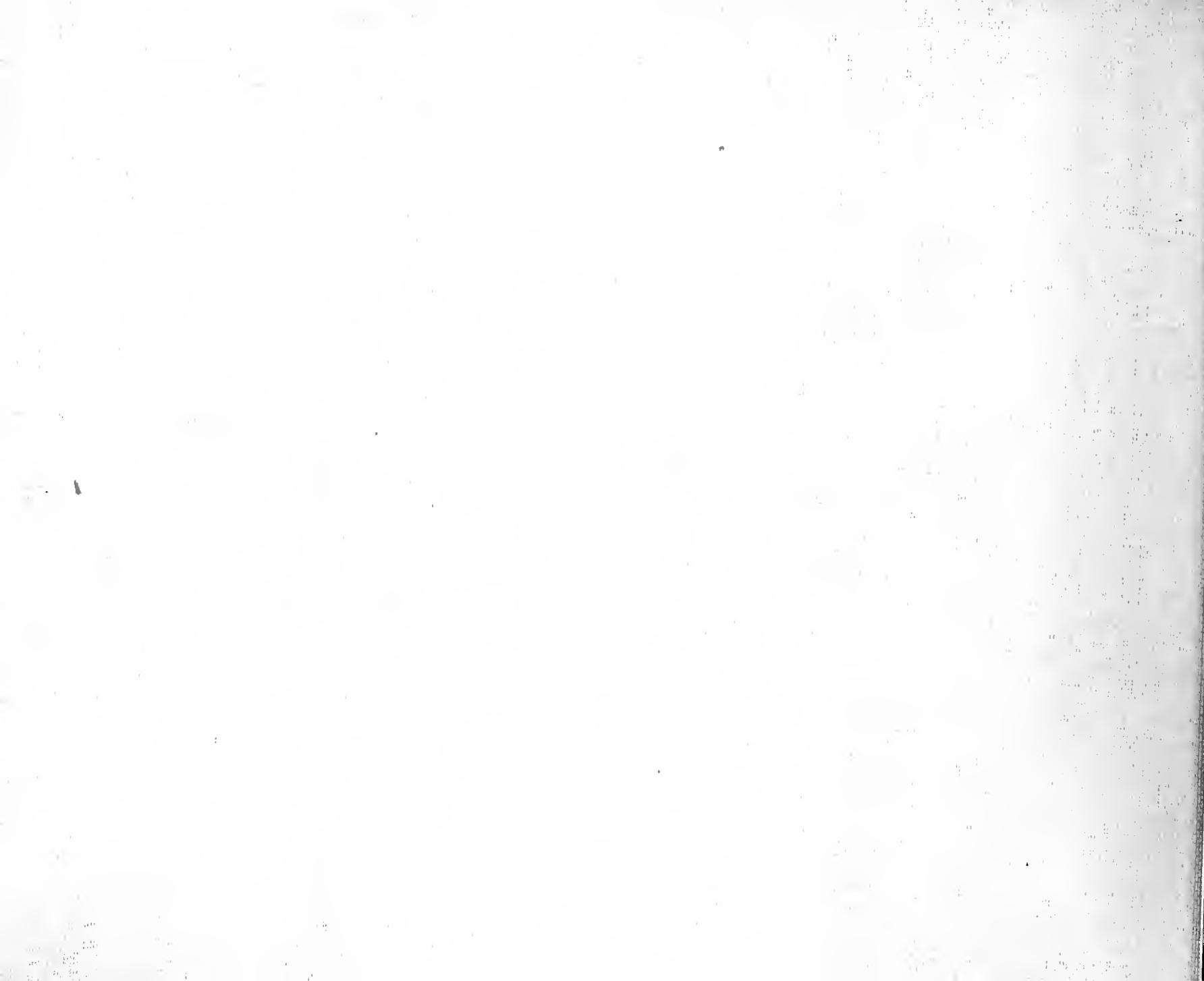
## BEVEL GEARS.

Cast Iron.      Full Size.



MARCH 31 1897.

*GEO K WAGNER. CLASS N<sup>o</sup> C97.*





Photograph of Plate Drawn by  
O. S. PIKE, Farmer, Age 25,

C. 1548. NEW LISBON, OHIO.

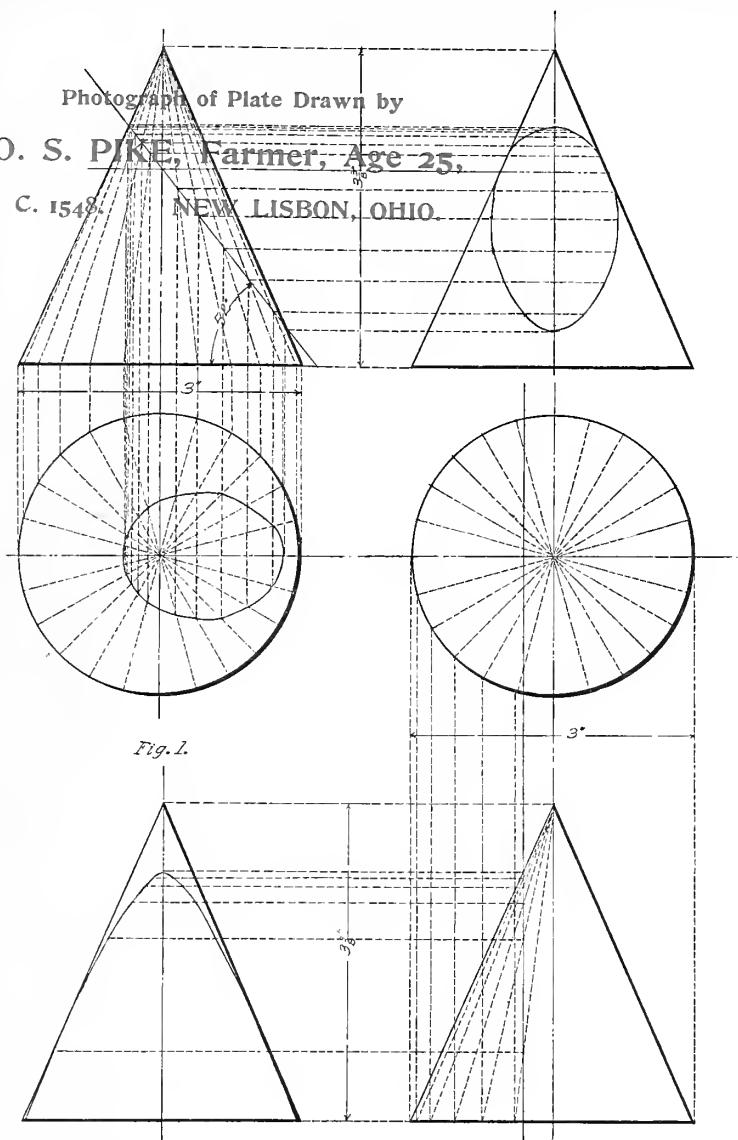


Fig. 3.

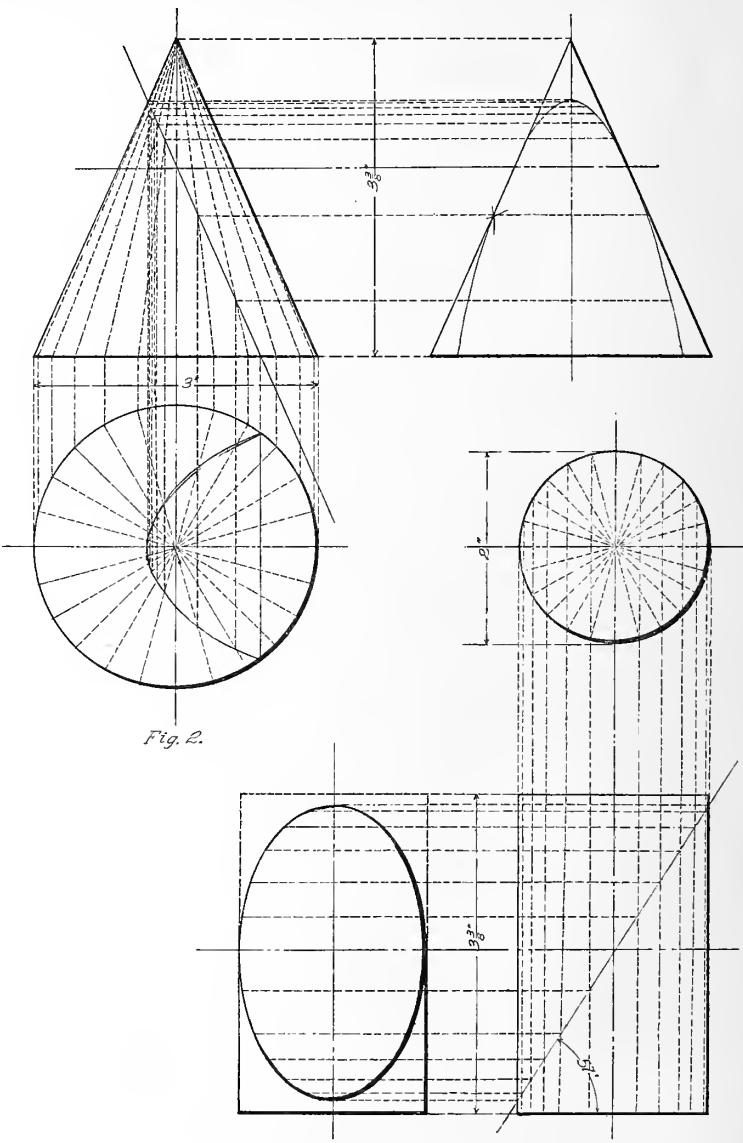


Fig. 4.

PLATE XXIV.

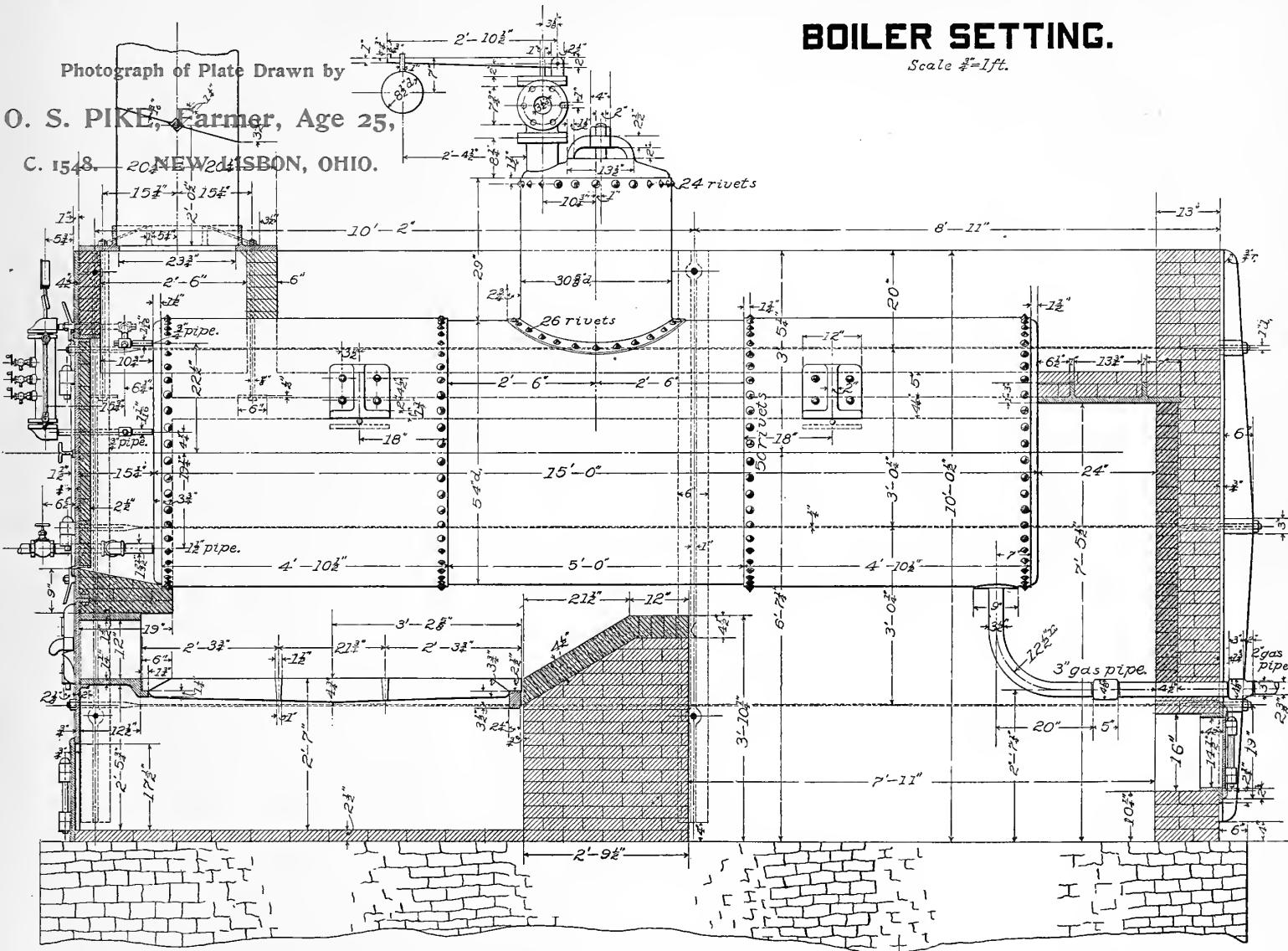
## BOILER SETTING.

Scale  $\frac{1}{4}''=1\text{ft.}$

Photograph of Plate Drawn by

O. S. PIKE, Farmer, Age 25,

C. 1548. 20 NEW LISBON, OHIO.



MARCH 15, 1896.

O. S. PIKE CLASS No. C 1548.





PLATE I

PROBLEM 1: To bisect a straight line

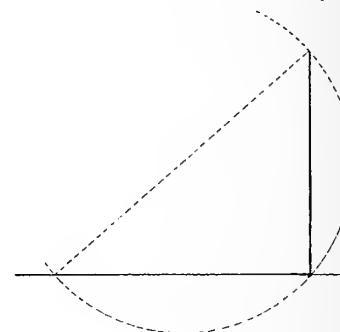
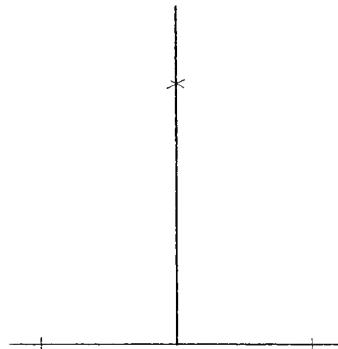
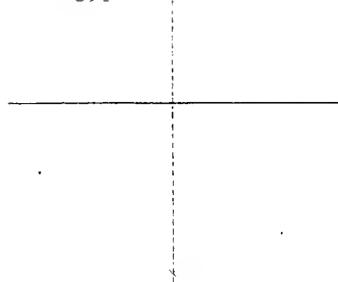
PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line.  
CASE I.

CASE II.

Photograph of Plate Drawn by

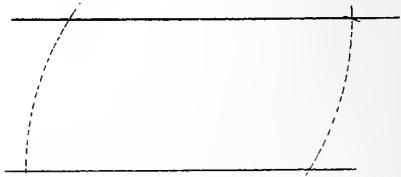
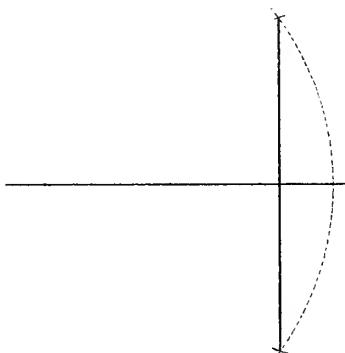
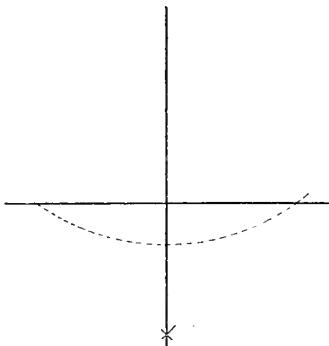
Fred. Kuhlmann, Machinist, Age 31.

880 N. Campbell Avenue,  
C. 2597. CHICAGO, ILL.



PROBLEM 3: To draw a perpendicular to a straight line from a point without it.  
CASE I.

PROBLEM 4: Through a given point to draw  
a straight line parallel to a given straightline



Photograph of Plate Drawn by  
**LARGE WHEEL**  
*Pitch dia 6.37"*  
*Pitch 1"*  
**Fred Juhlmann, Machinist, Age 31,**  
**20 Teeth**  
**880 N. Campbell Avenue,**  
**PINION.**  
*Pitch dia 5.09"*  
*Pitch 1"*  
**16 Teeth.**  
**CHICAGO, ILL.**

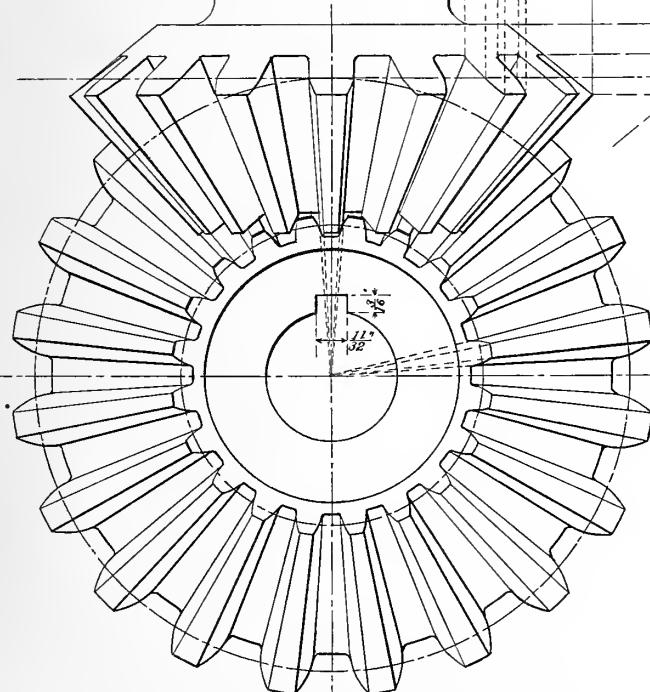


Fig. 2.

## BEVEL GEARS.

Cast Iron. Full Size.

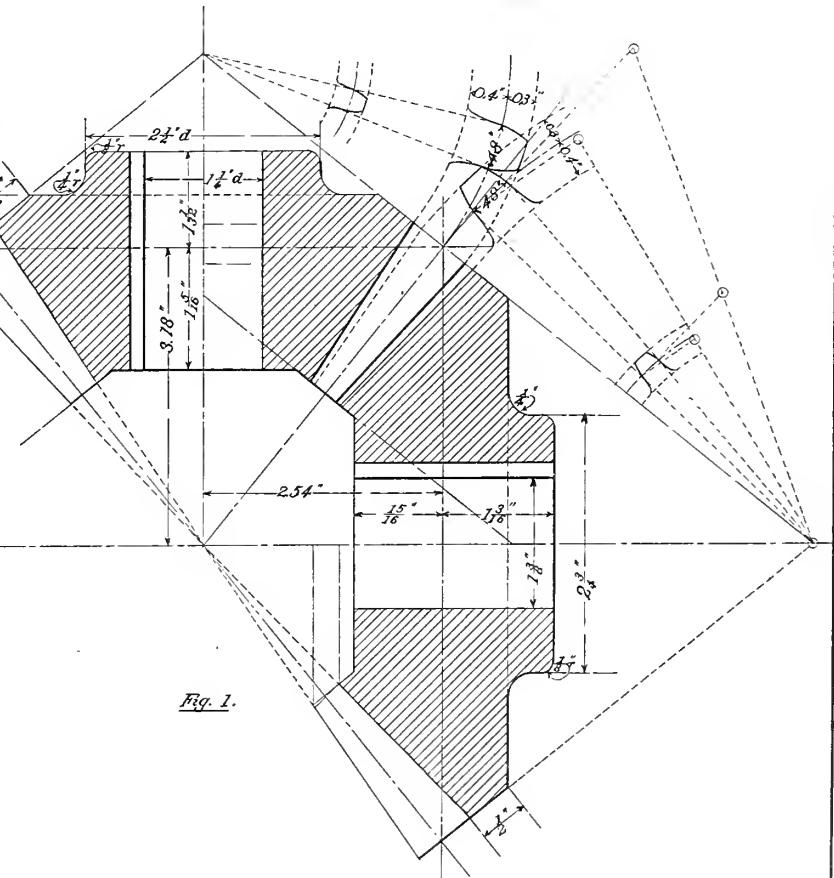
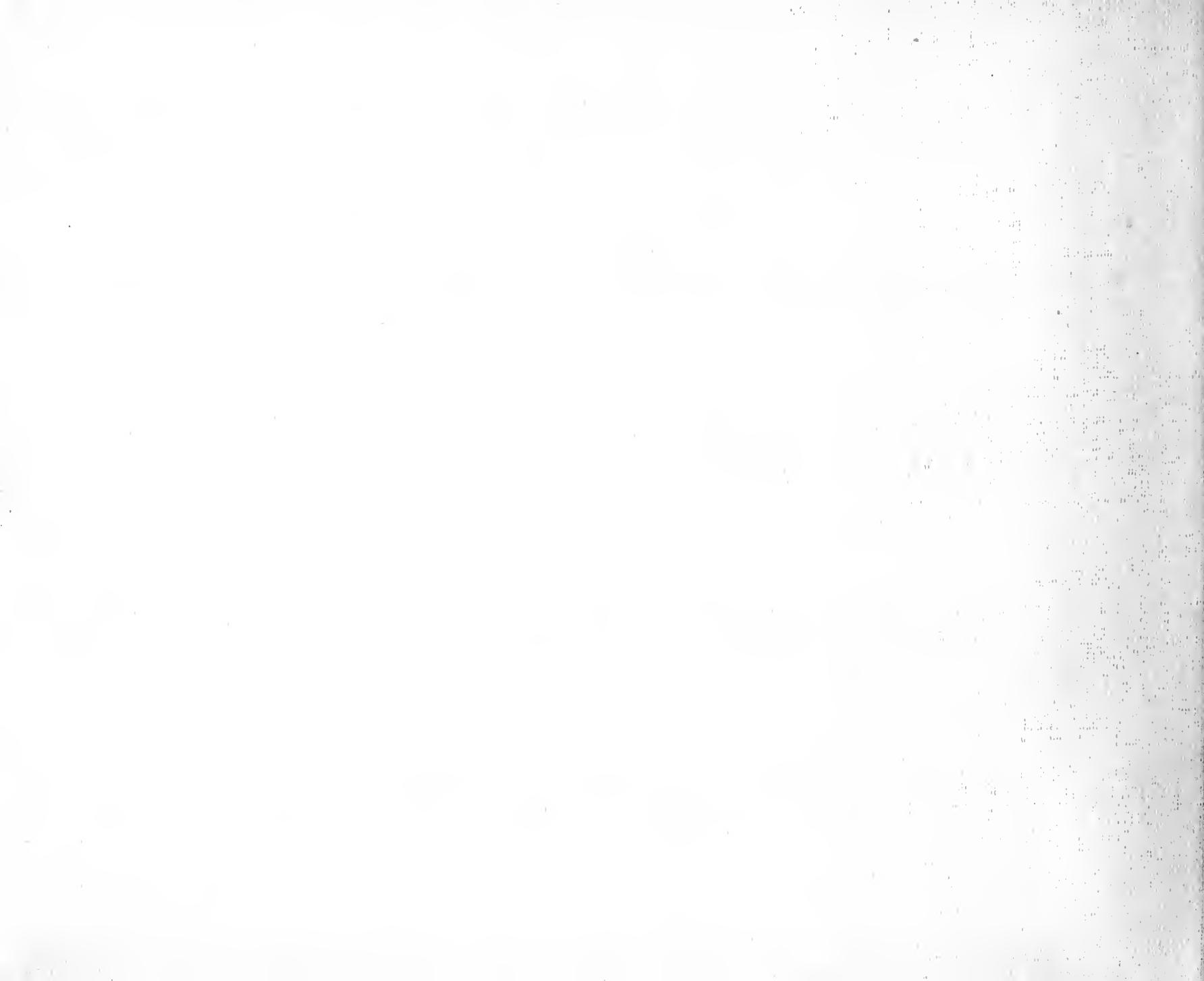


Fig. I





PROBLEM 1: To bisect a straight line

PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line

CASE I.

CASE II.

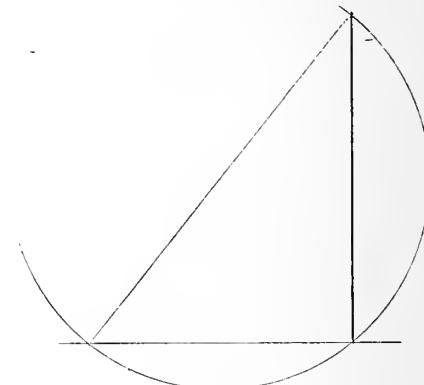
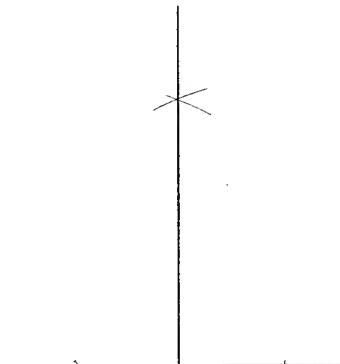
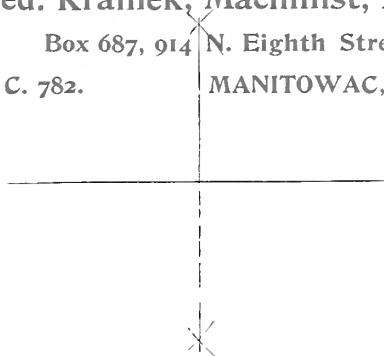
Photograph of Plate Drawn by

Fred. Krainek, Machinist, Age 20,

Box 687, 914 N. Eighth Street,

C. 782.

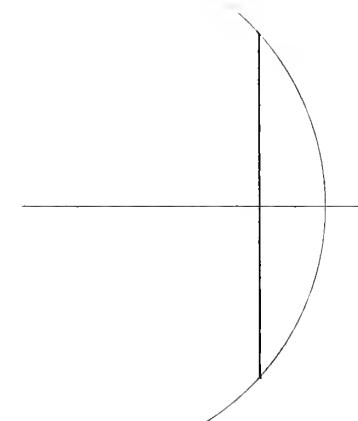
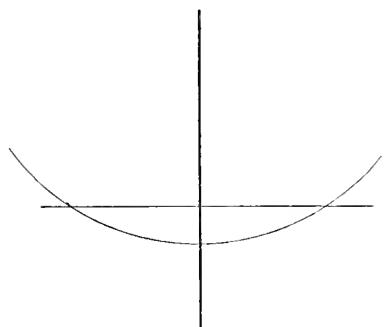
MANITOWAC, WIS.



PROBLEM 3: To draw a perpendicular to a point without it

CASE I.

CASE II.



PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line

MAY, 18, 1895.

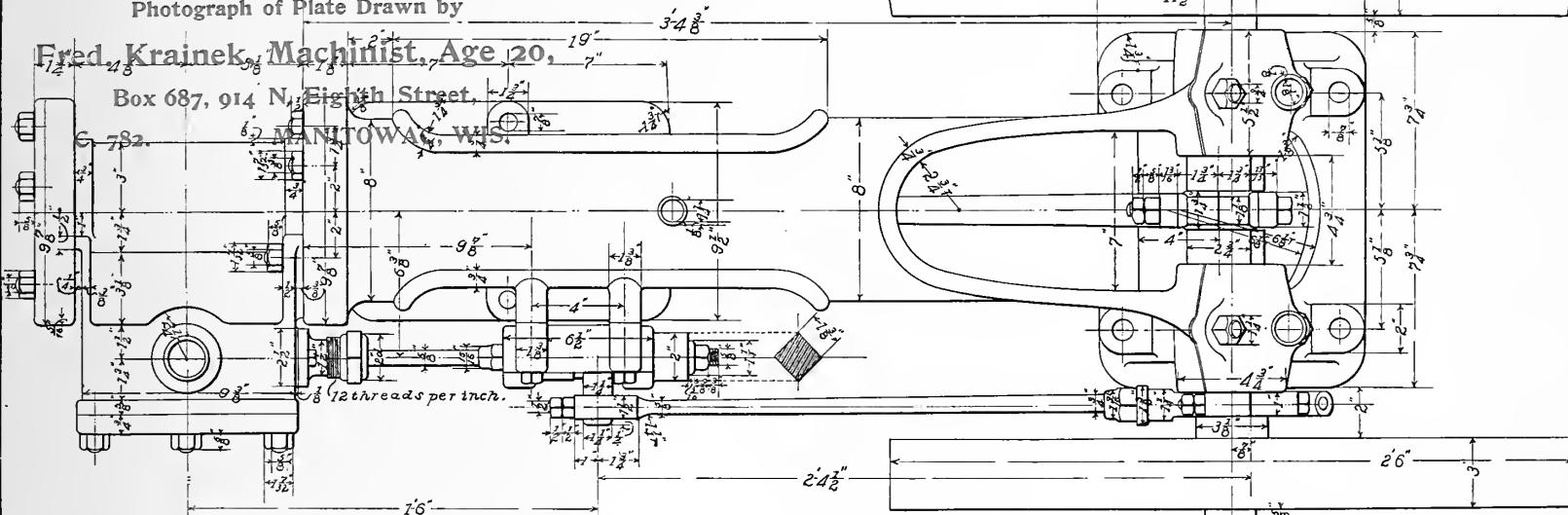
Fred Krainek, Class, No. 782.

Photograph of Plate Drawn by

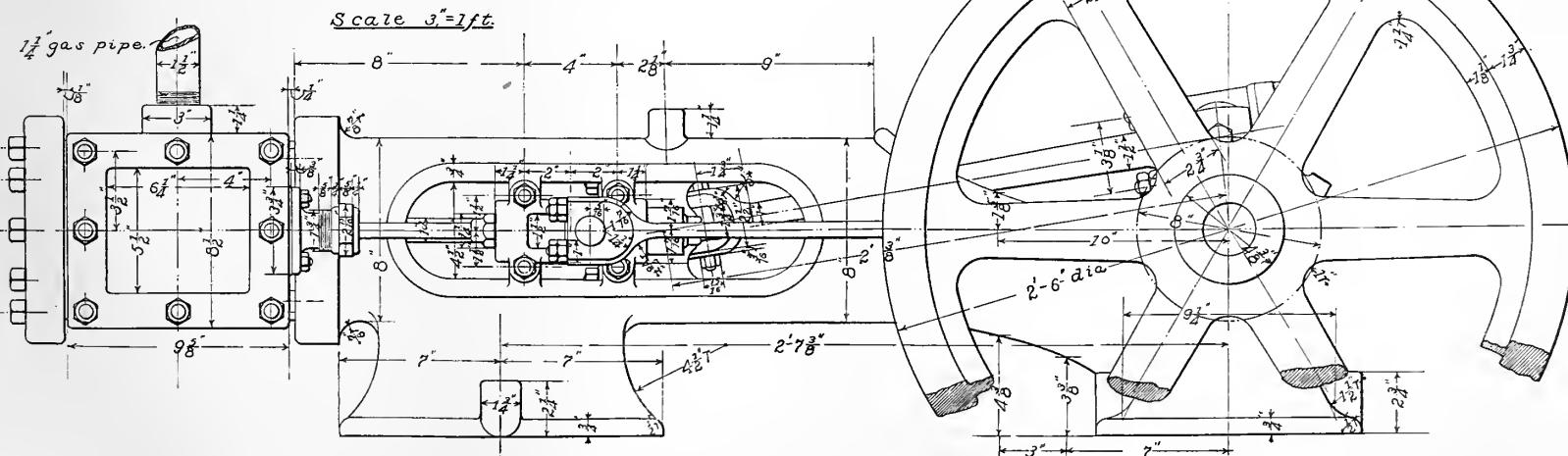
Fred Krajnek, Machinist, Age 20,

Box 687, 914 N. Eighth Street,

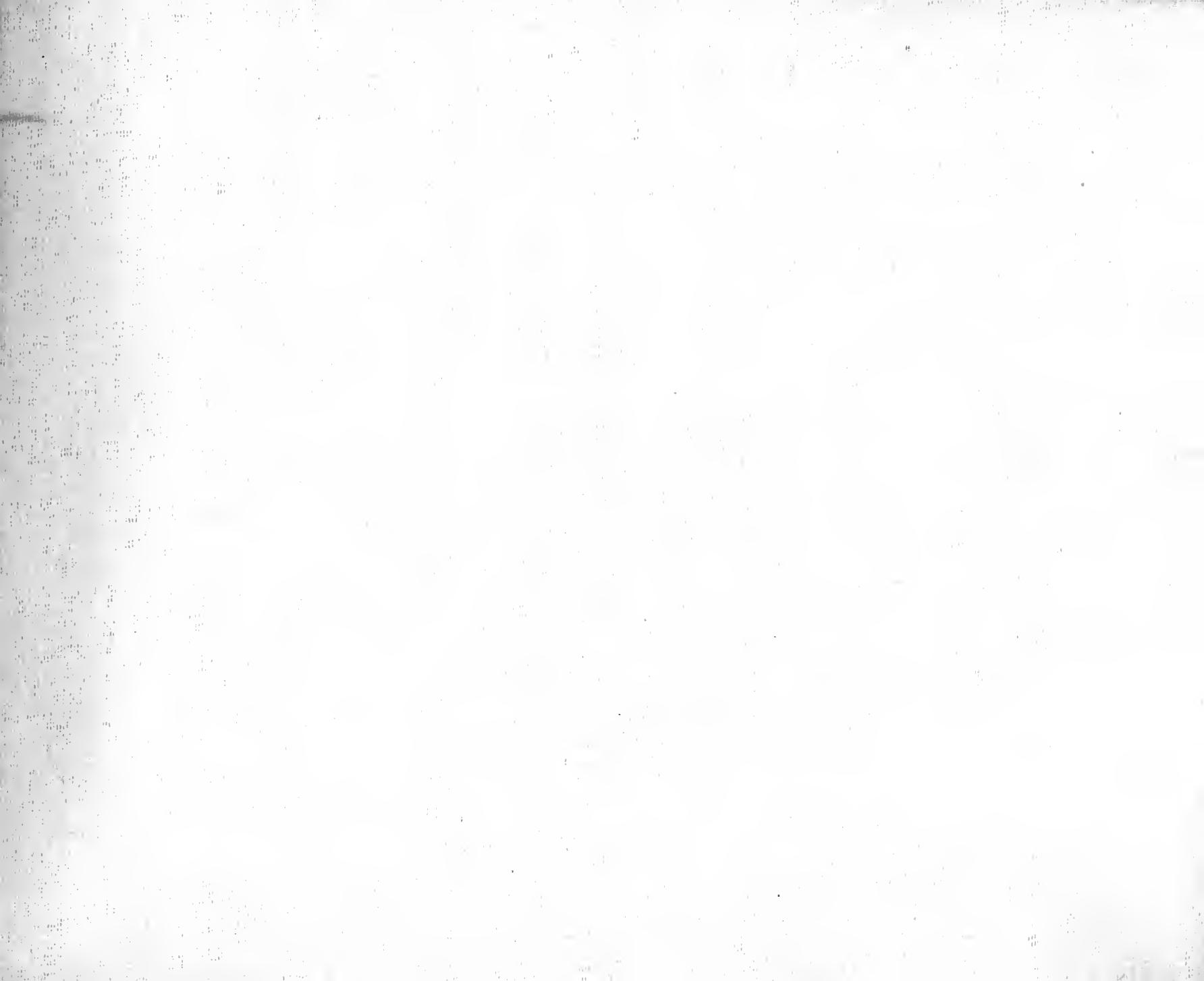
MANICOWAC, WIS.

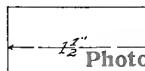


## SIX HORSE POWER HORIZONTAL STEAM ENGINE.









Chas. Kuderer, Machinist, Age 20,

40 West Second Street,

C. 417.

ELIZABETHPORT, N. J.

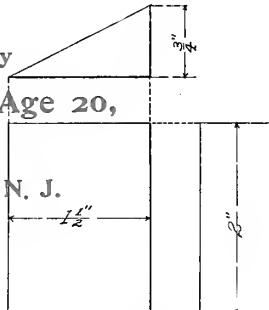
 $\frac{3}{4}$ 

Fig. 1.

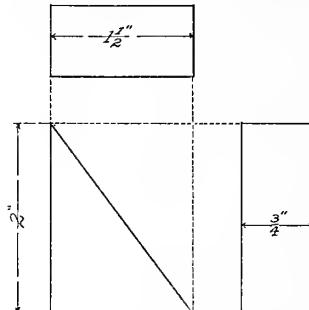


Fig. 3.

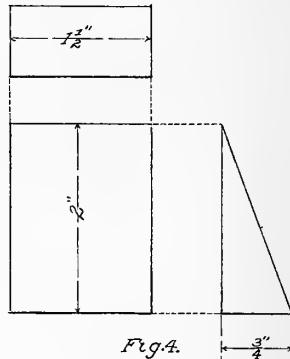


Fig. 4.

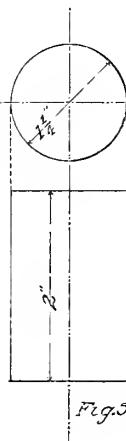


Fig. 5.

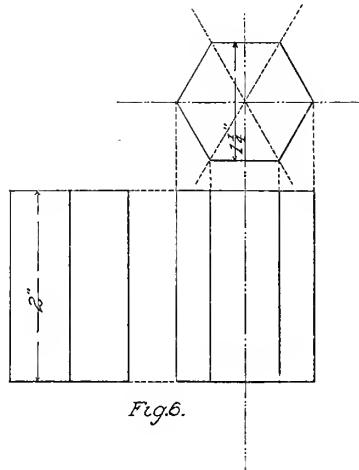


Fig. 6.

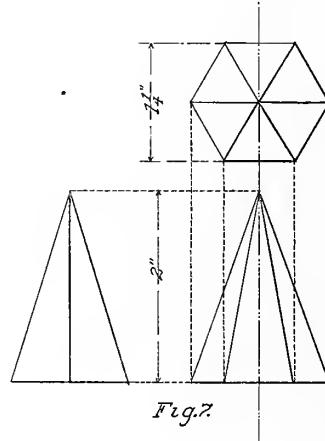


Fig. 7.

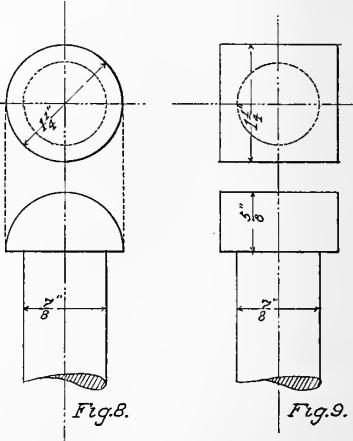


Fig. 8.

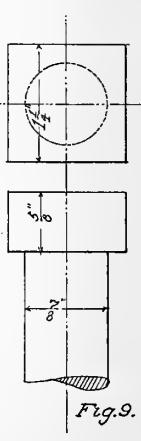


Fig. 9.

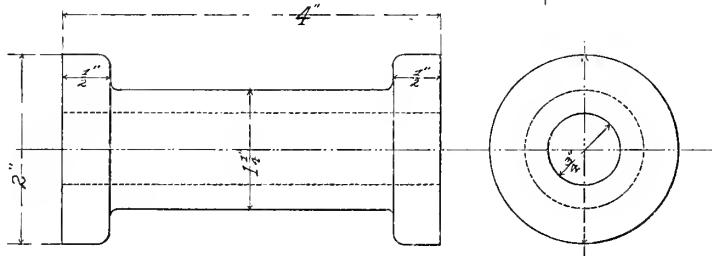


Fig. 10.

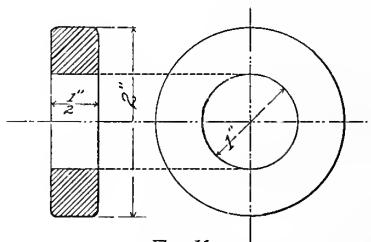


Fig. 11.

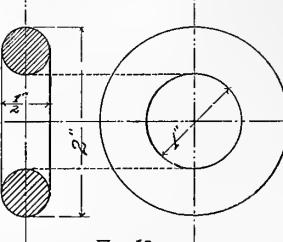


Fig. 13.

PLATE XXIII.

BOILER SETTING.

Scale  $\frac{1}{4}$  in. to 1 ft.

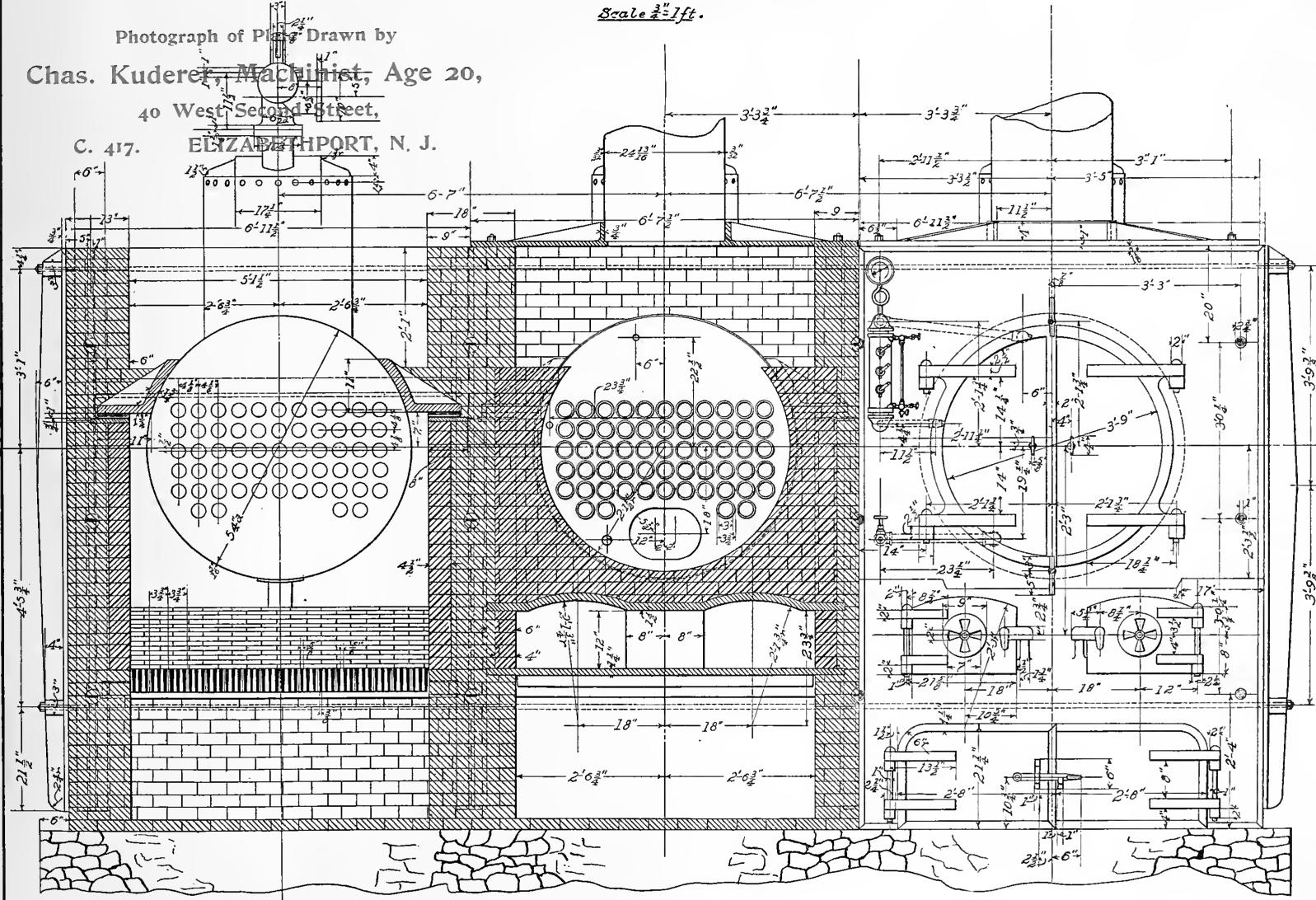
Photograph of Plans Drawn by

Chas. Kuderer, Machinist, Age 20,

40 West Second Street,

ELIZABETHPORT, N. J.

C. 417.



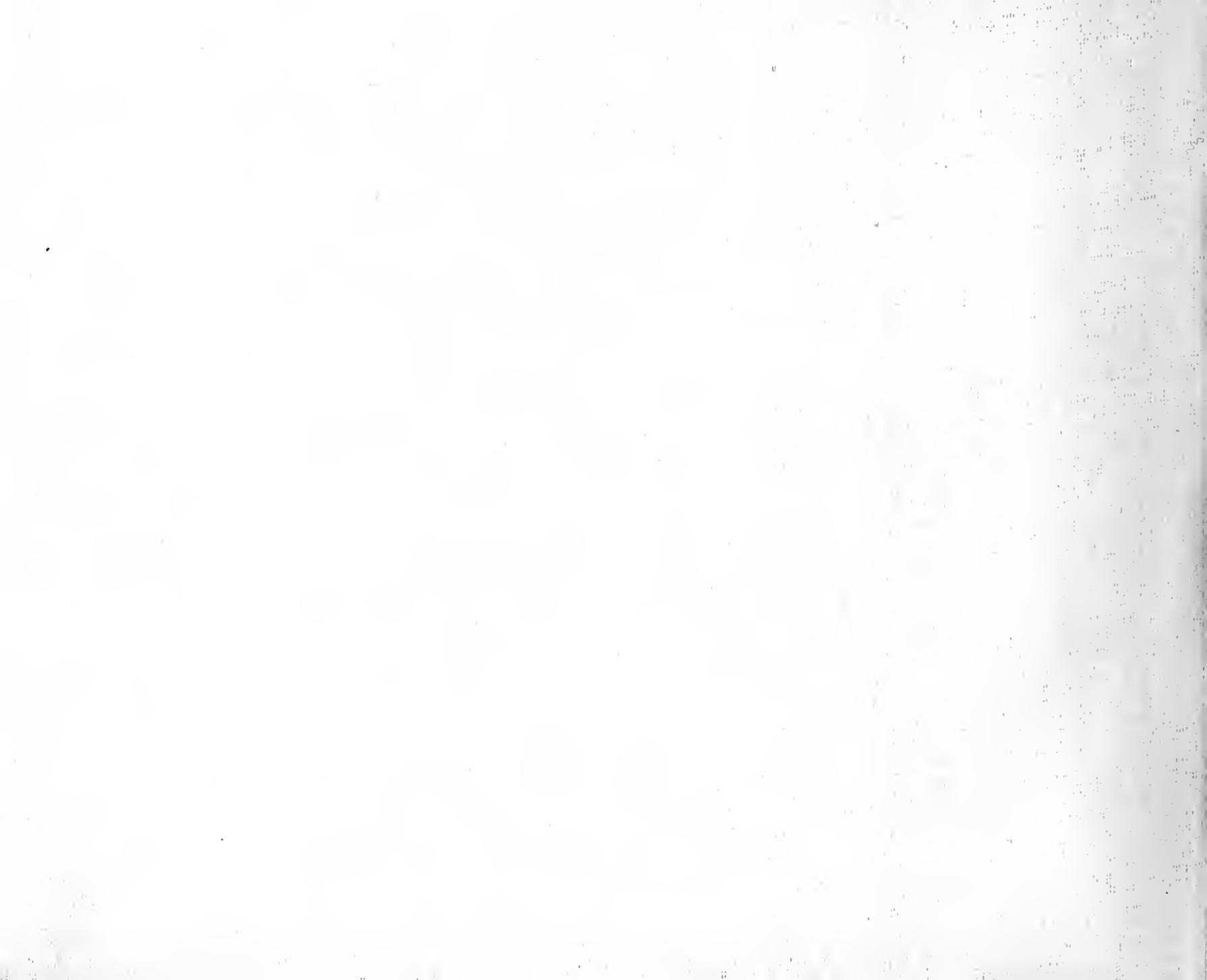




PLATE I

PROBLEM 1: To bisect a straight line.

PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line.

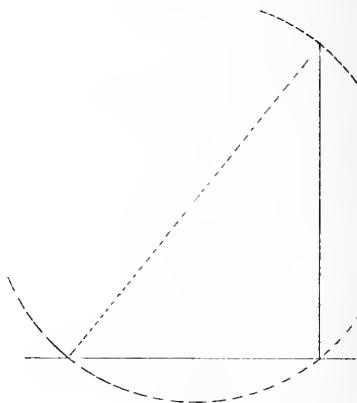
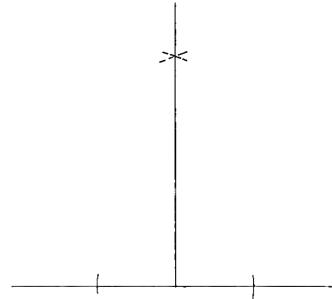
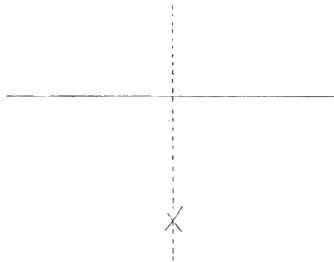
CASE I

CASE II

Photograph of Plate Drawn by

G. Wiebe, Jr., Age 24,  
Engineer and Fireman,

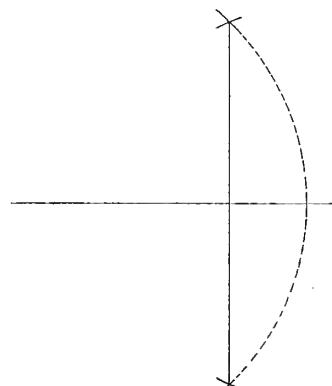
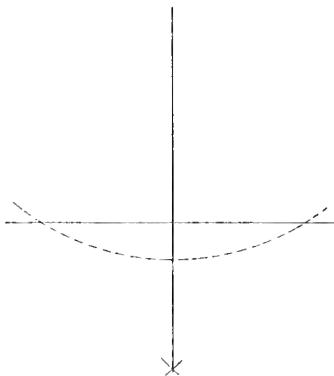
C. 753. BOX 48, HALSTEAD, KAN.



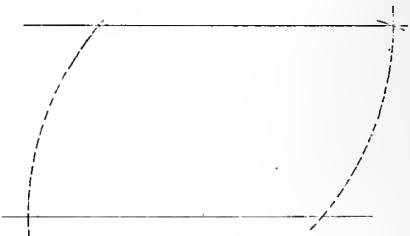
PROBLEM 3: To draw a perpendicular to a straight line from a point without it.

CASE I

CASE II



PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line.

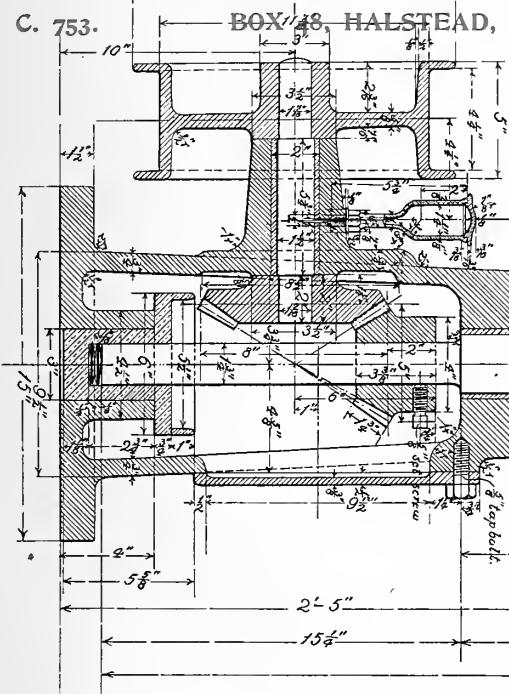


Photograph of Plate Drawn by

G. Wiebe, Jr., Age 24,

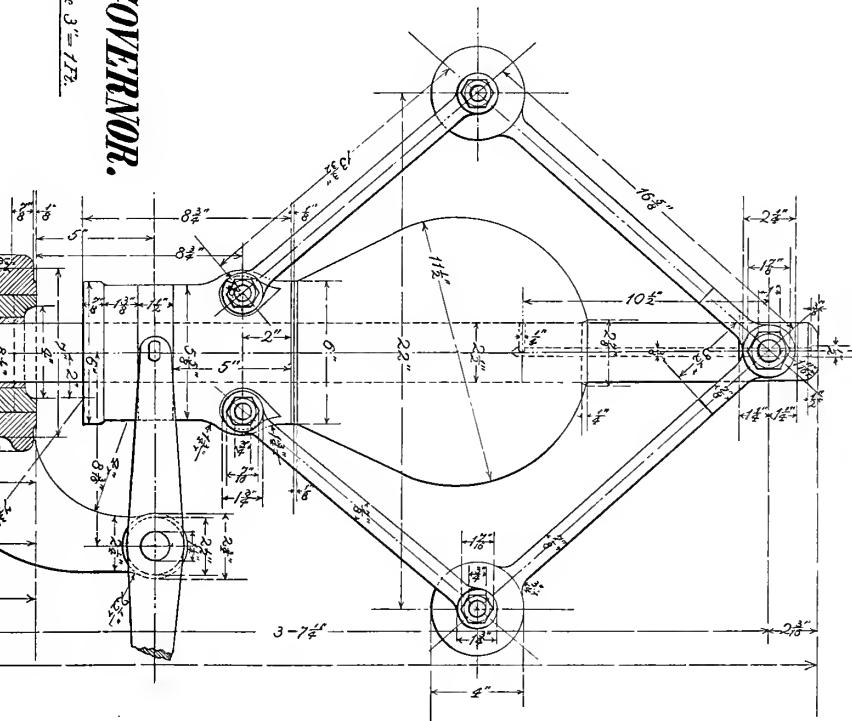
Engineer and Fireman,

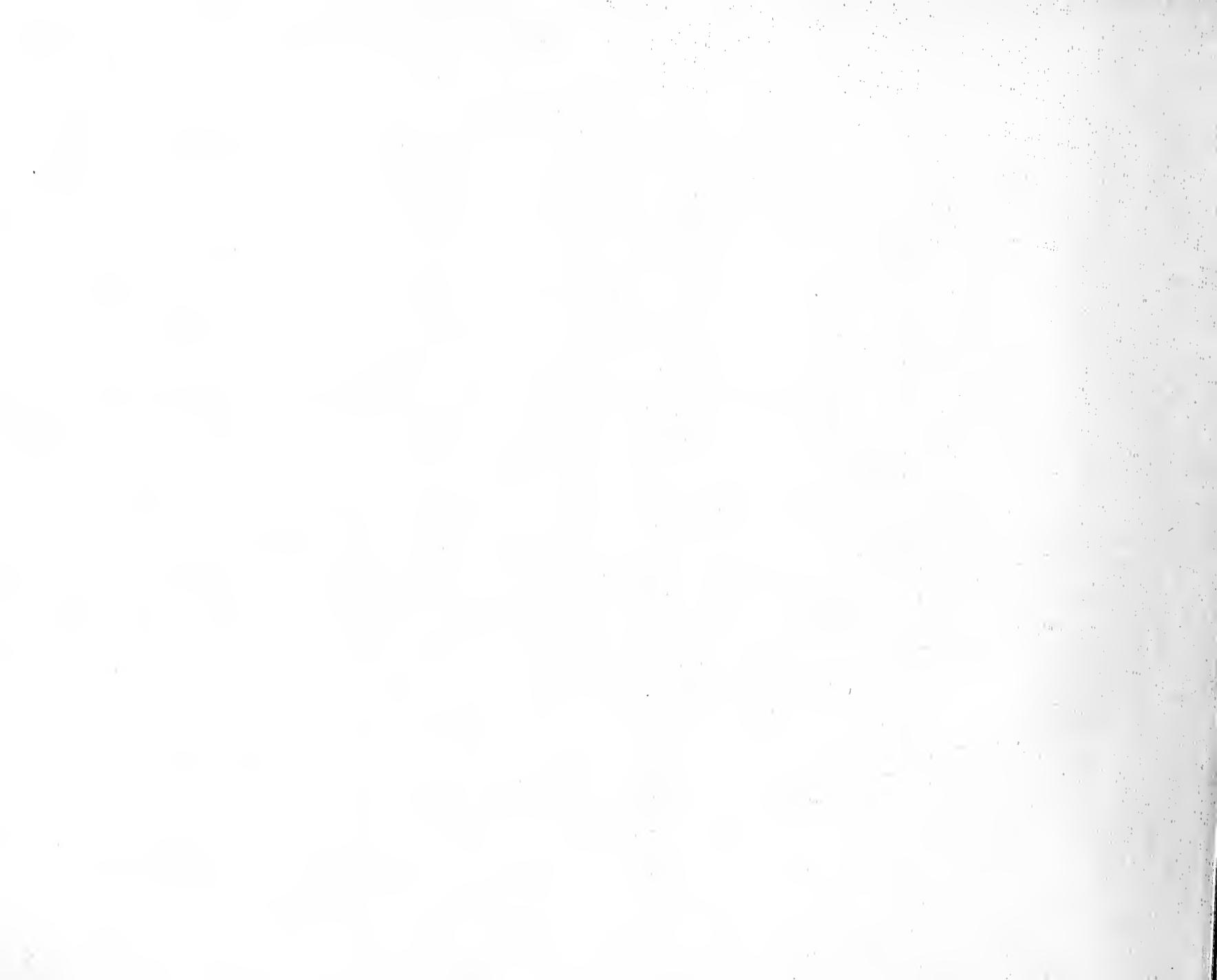
C. 753. BOX 48, HALSTEAD, KAN.

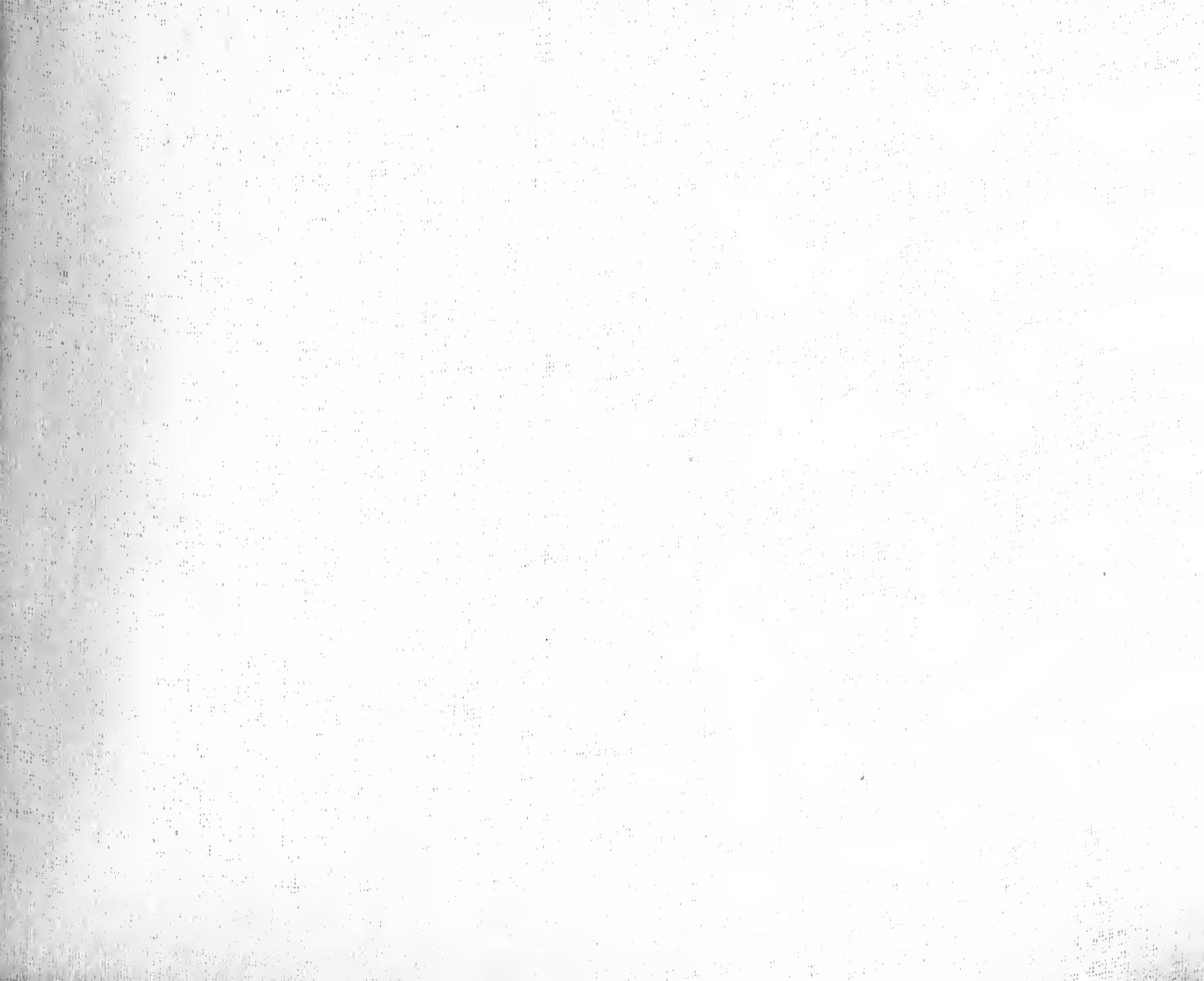


WEIGHTED GOVERNOR.

Scale 3' = 1" P.L.







PROBLEM 1: - To bisect a given straight line

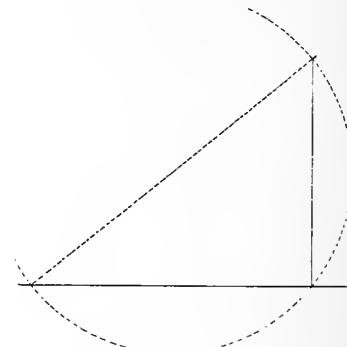
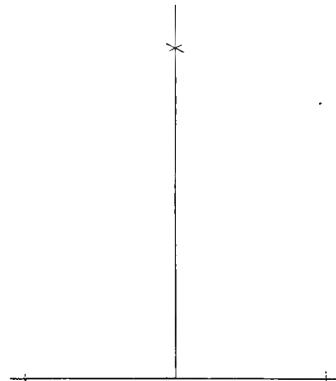
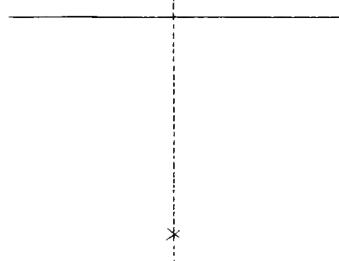
PROBLEM 2: - To draw a perpendicular to a straight line from a given point in that line:

Case I.

Case II.

Photograph of Plate Drawn by

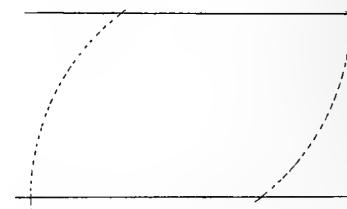
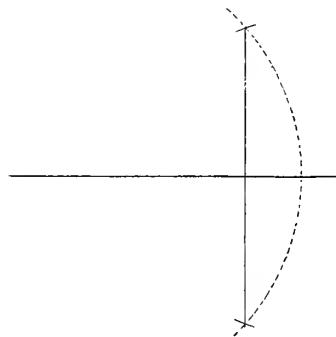
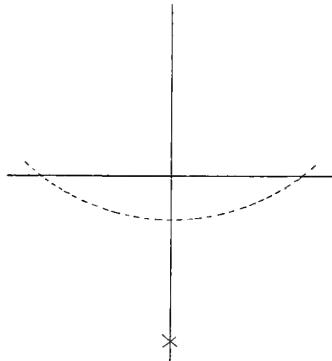
John Lloyd, Machinist, Age 32,  
58 Dana Street,  
M. D. 526. WILKES-BARRE, PA.



PROBLEM 3: To draw a perpendicular to a straight line from a given point without it:  
Case I.

Case II.

PROBLEM 4: - Through a given point to draw a straight line parallel to a given straight line



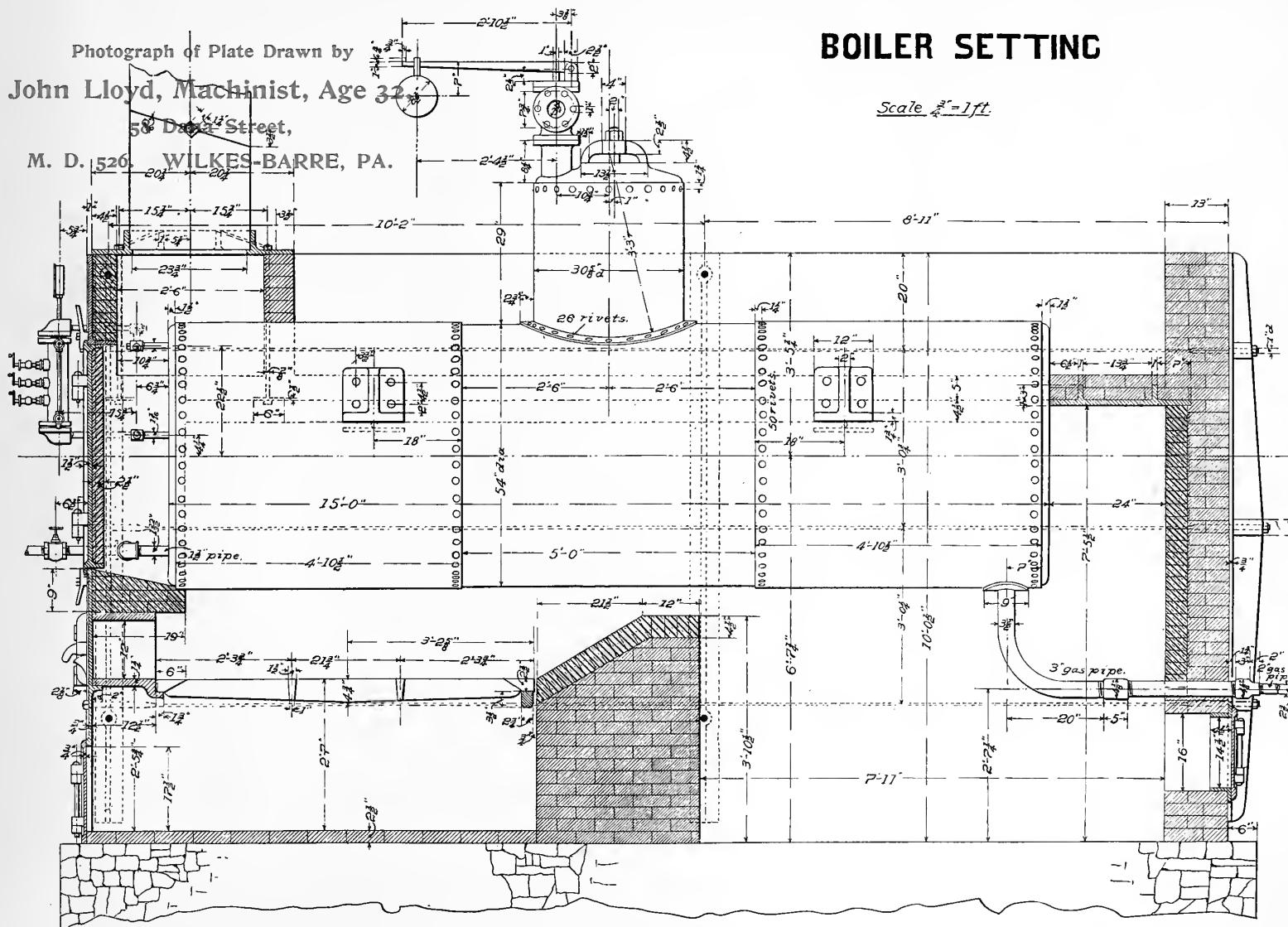
## BOILER SETTING

Photograph of Plate Drawn by

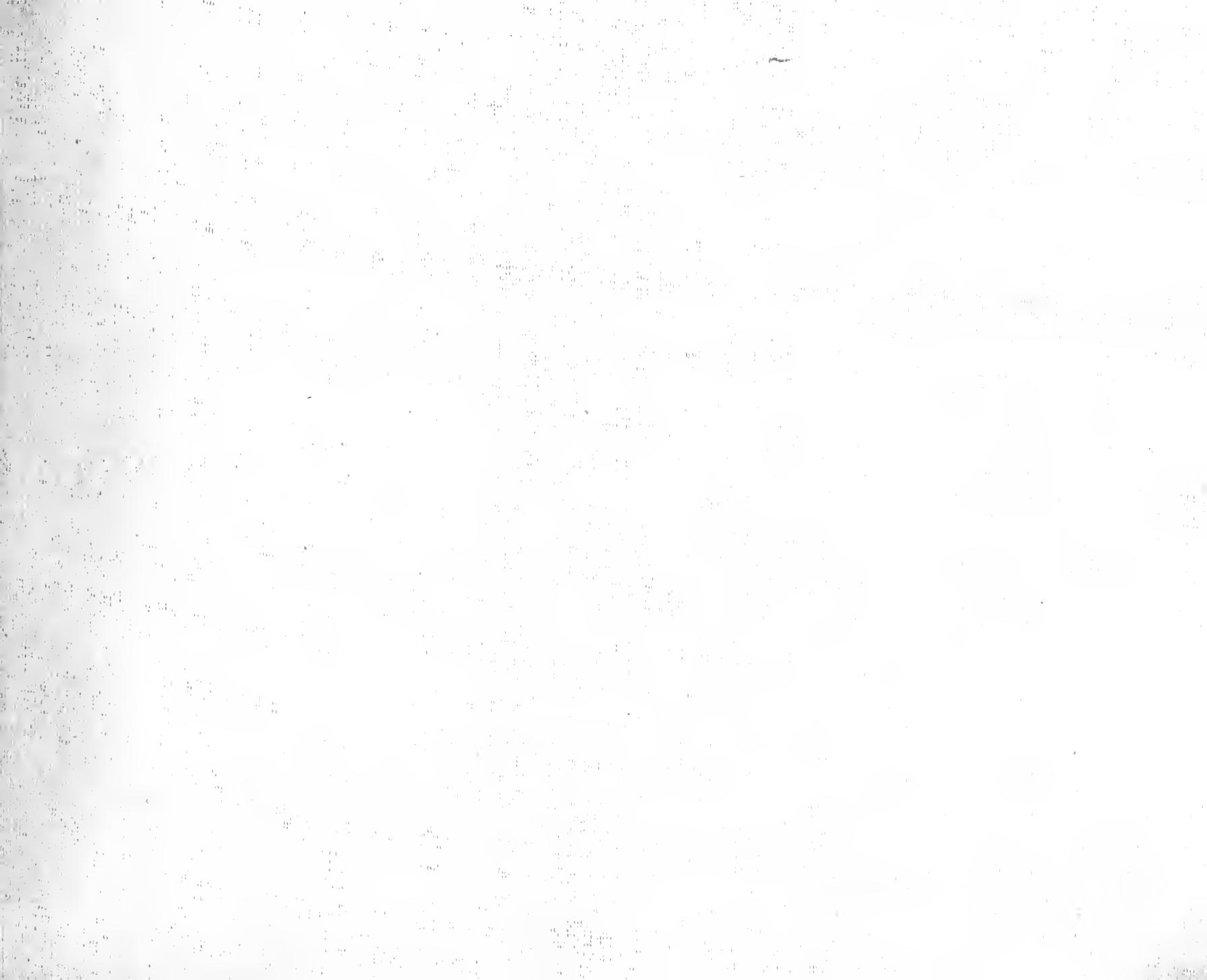
John Lloyd, Machinist, Age 32

58 Dear Street,

M. D. 526. WILKES-BARRE, PA.

Scale  $\frac{3}{4}'' = 1\text{ ft.}$ 





PROBLEM 1: To bisect a given straight line:

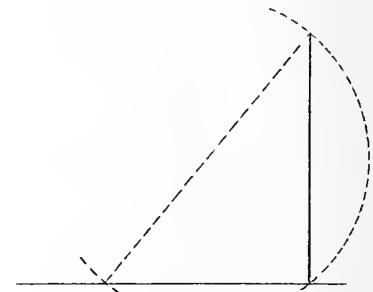
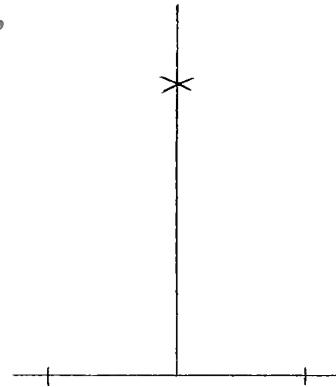
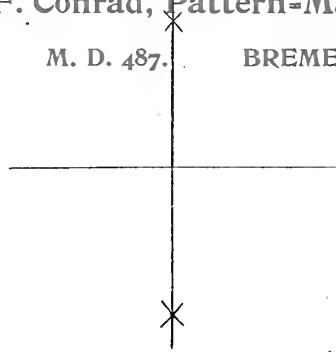
PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line:  
CASE I.  
CASE II.

Photograph of Plate Drawn by

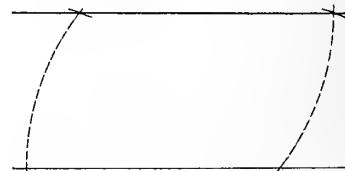
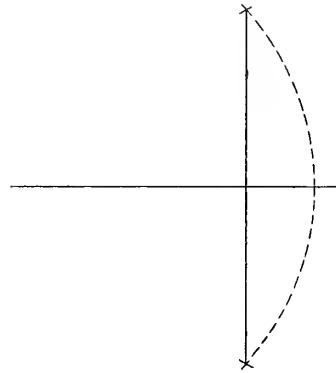
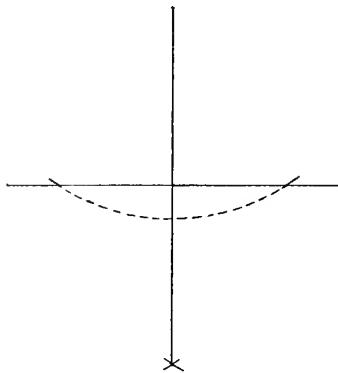
E. F. Conrad, Pattern-Maker, Age 36,

M. D. 487.

BREMEN, IND.

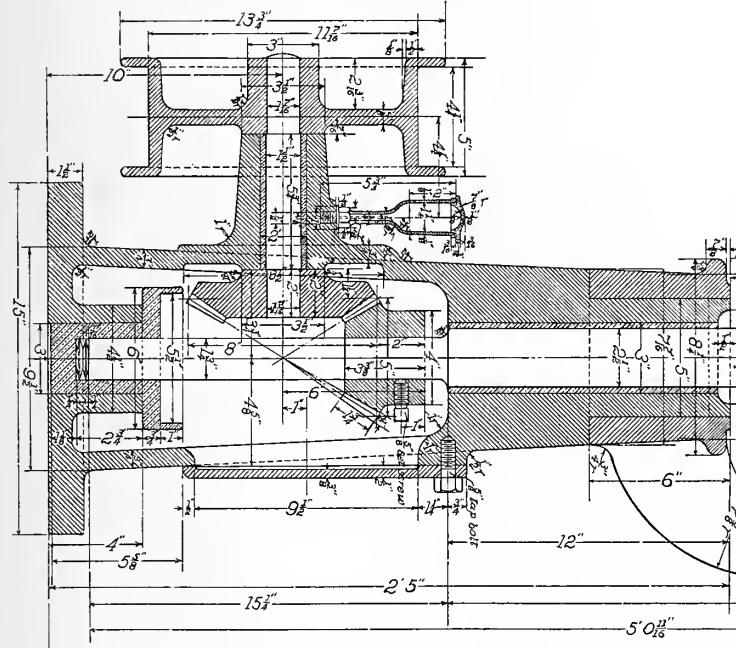
PROBLEM 3: To draw a perpendicular to a straight line from a given point without it:  
CASE I.  
CASE II.

PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line:



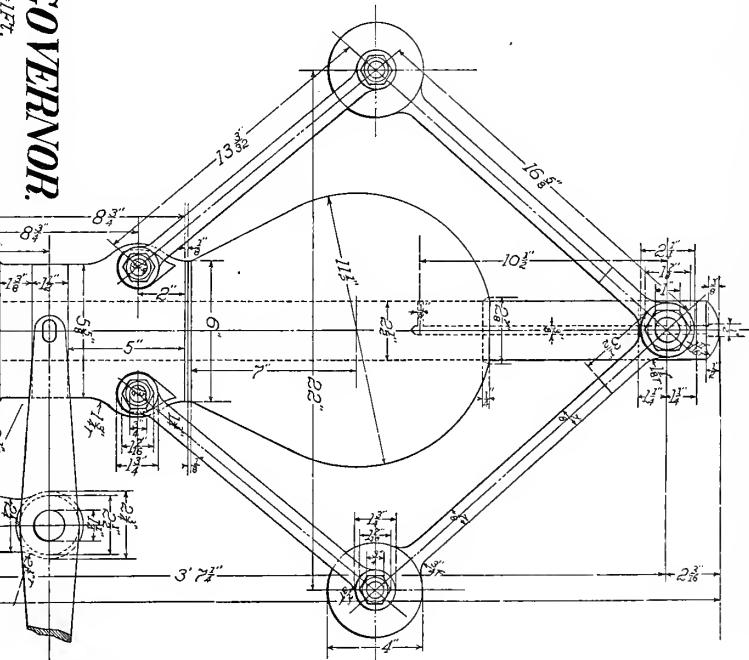
Photograph of Plate Drawn by  
E. F. Conrad, Pattern-Maker, Age 36,

M. D. 487. BREMEN, IND.



# WEIGHTED GOVERNOR.

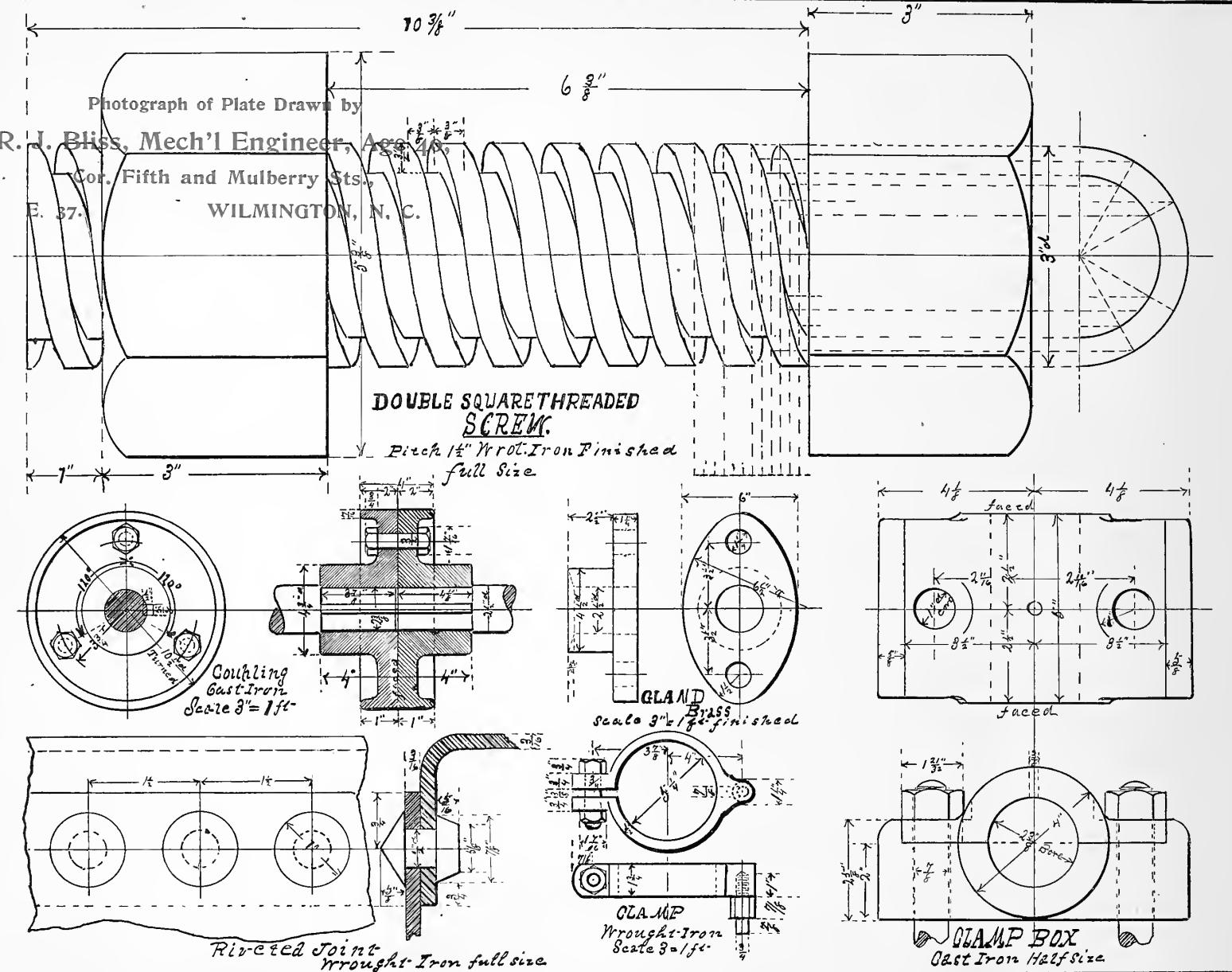
Scale 3"=1Ft.







# PLATE XI.



R. J. Bliss Class E. 37.

## PLATE XXIV.

Photograph of Plate Drawn by  
R. J. Bliss, Mech'l Engineer, Age 40,

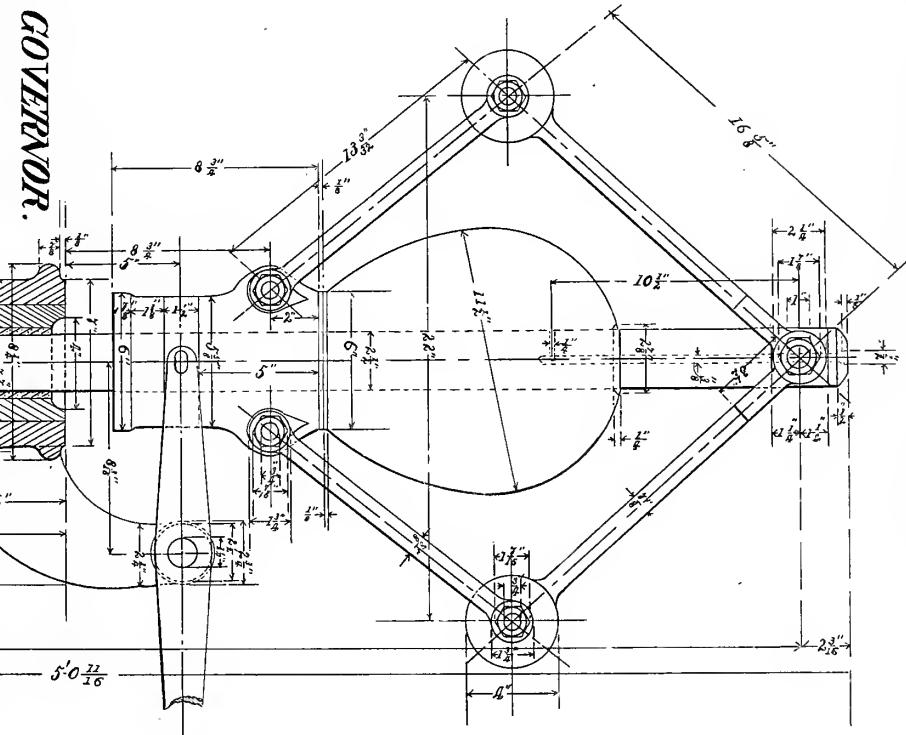
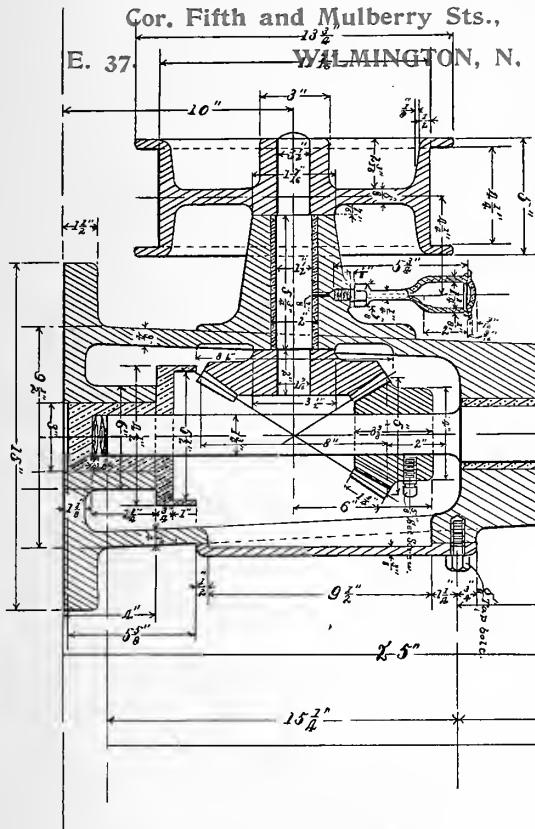
Cor. Fifth and Mulberry Sts.,

18 1/2  
67. WILMINGTON, N. C.

7. ~~WILMINGTON, N. C.~~

## WEIGHED GOVERNOR.

Scale 3" = 1 ft.



NOV 24-1894.

*R. J. BLISS. E-34.*





PROBLEM 1: To bisect a straight line.

PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line  
CASE I.

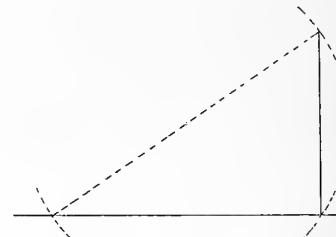
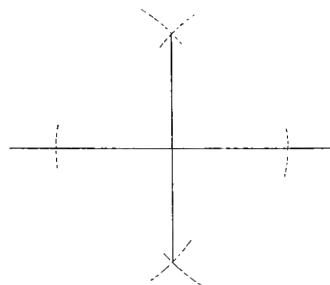
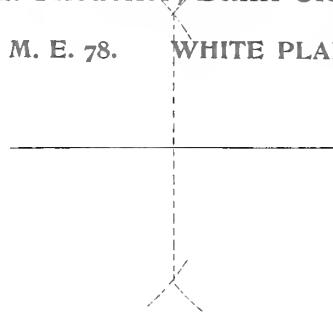
CASE II.

Photograph of Plate Drawn by

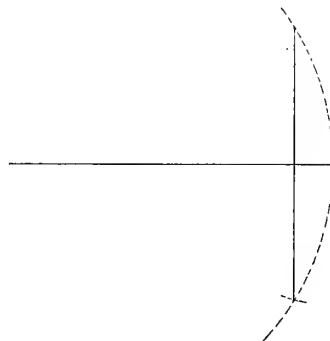
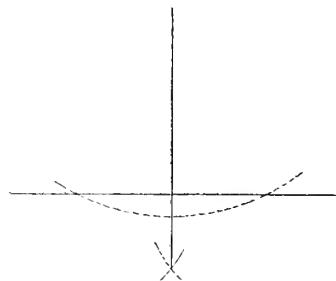
S. E. Snedeker, Bank Clerk, Age 23,

M. E. 78.

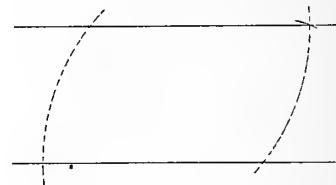
WHITE PLAINS, N. Y.

PROBLEM 3: To draw a perpendicular to a straight line from a point without it.  
CASE I.

CASE II.



PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line.



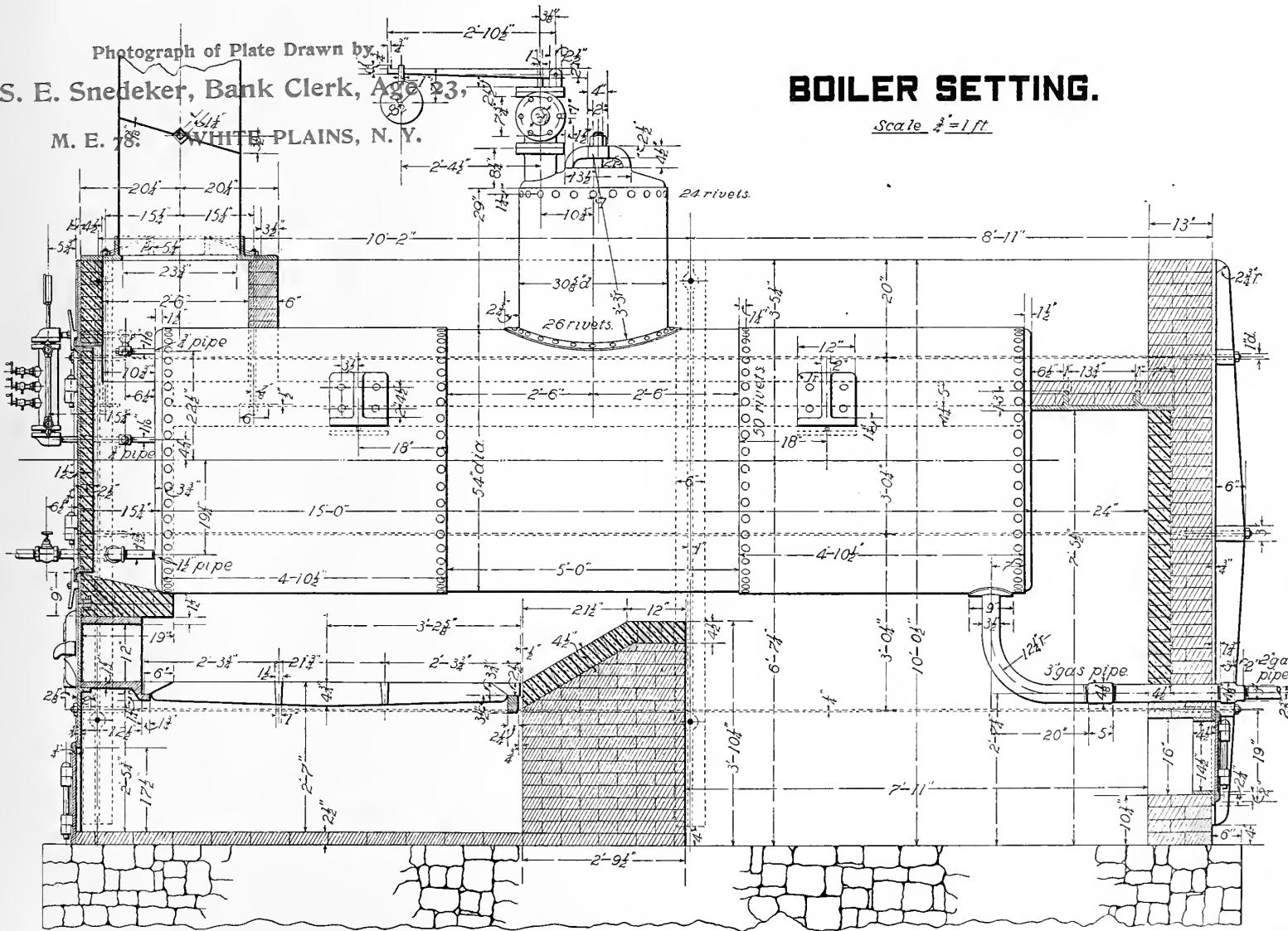
Photograph of Plate Drawn by

S. E. Snedeker, Bank Clerk, Age 23,

M. E. 78. ~~WHITE PLAINS, N. Y.~~

## **BOILER SETTING.**

Scale  $\frac{3}{4}'' = 1 \text{ ft.}$



NOVEMBER 19, 1896.

S.E. SNEDEKER, CLASS NO. M.E. 78.

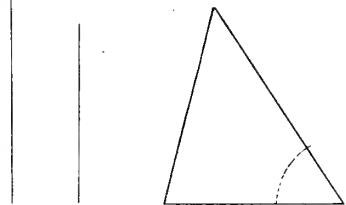




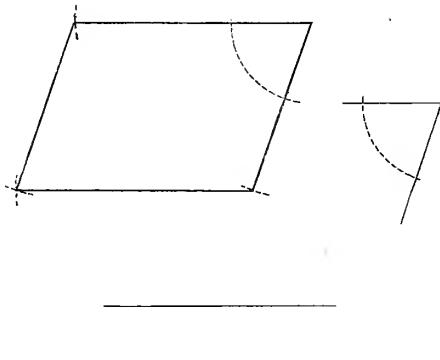
PROBLEM 10: Two sides and the included angle of a triangle being given, to construct the triangle.

Photograph of Plate Drawn by

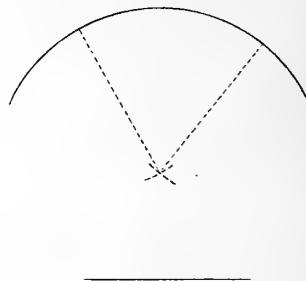
E. Thompson, Clerk, Age 29,  
69 Schaeffer Street,  
M. E. 1138. BROOKLYN, N. Y.



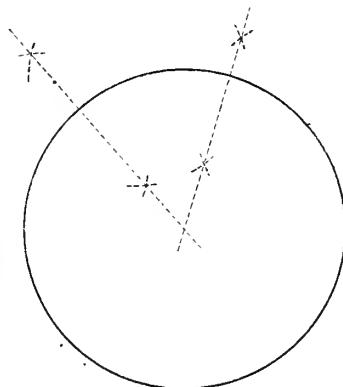
PROBLEM 11: To draw a parallelogram when the sides and one of the angles are given:



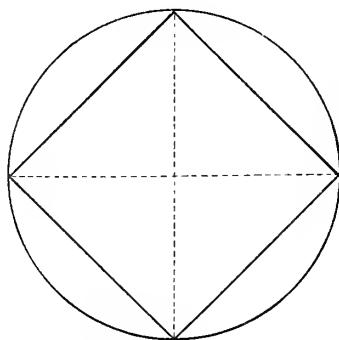
PROBLEM 12: An arc and its radius being given, to find its centre:



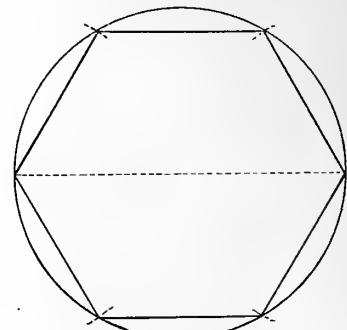
PROBLEM 13: To pass a circumference through any three points not in the same straight line:



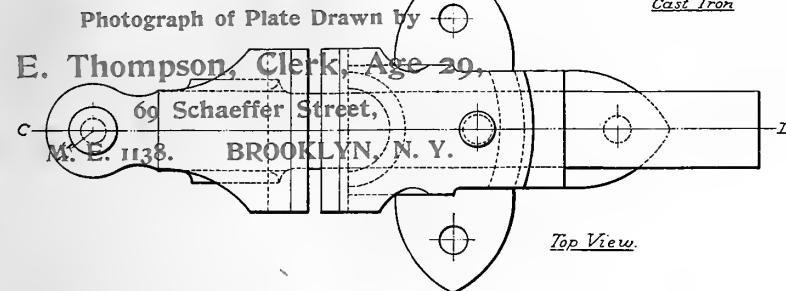
PROBLEM 14: To inscribe a square in a given circle:



PROBLEM 15: To inscribe a regular hexagon in a given circle:



## BENCH VISE.



Cast Iron

Half Size

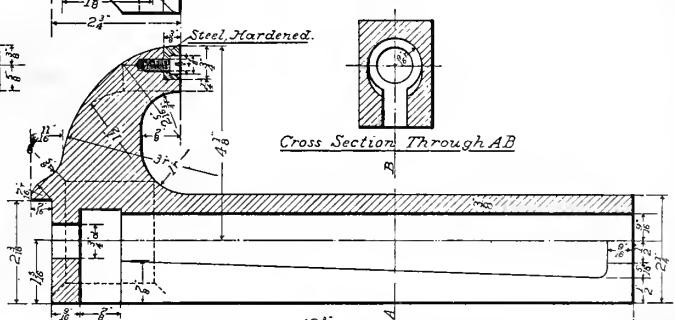
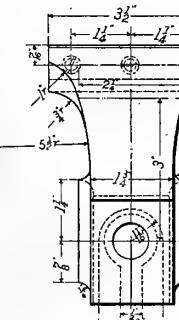
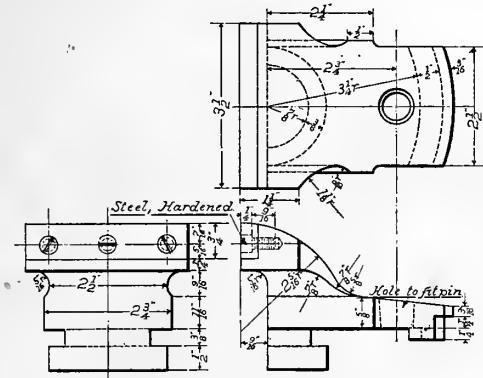
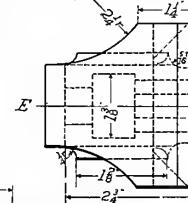
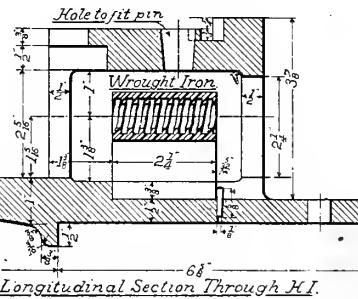
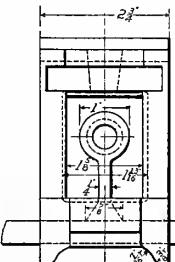
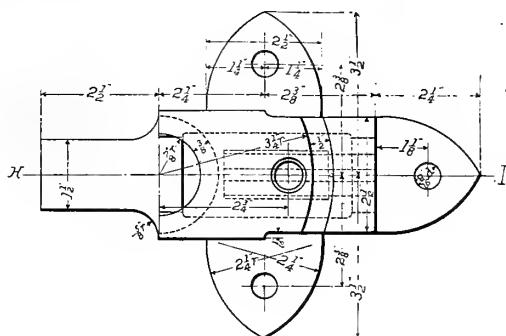
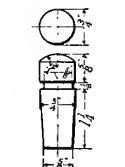
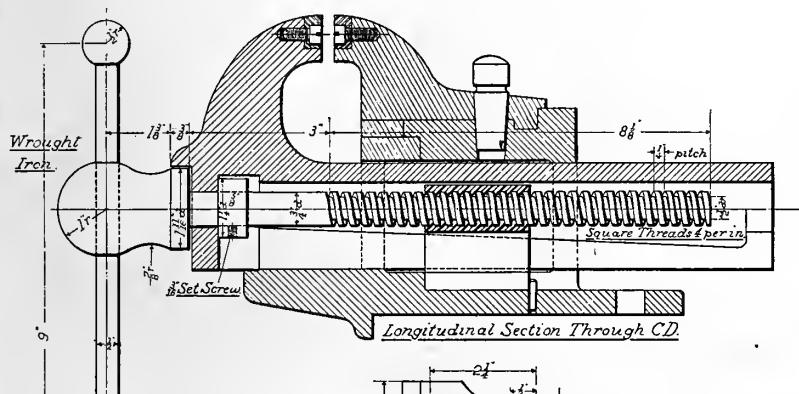






PLATE I.

PROBLEM 1: To bisect a straight line.

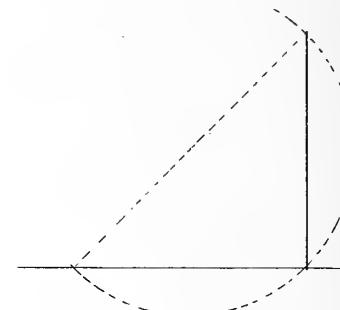
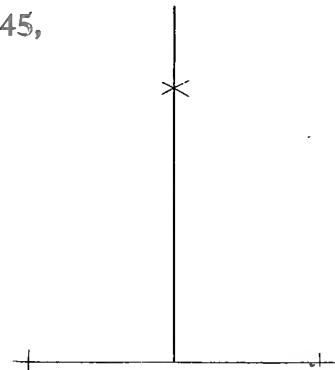
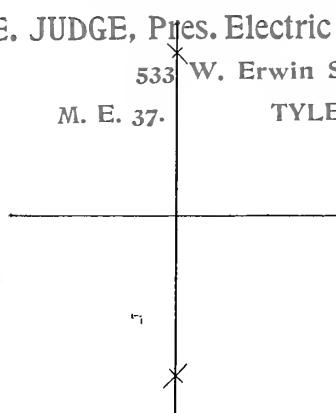
PROBLEM 2: To draw a perpendicular to a straight line from a given point in that line.  
CASE I.

CASE II.

Photograph of Plate Drawn by

A. E. JUDGE, Pres. Electric Light Co., Age 45,

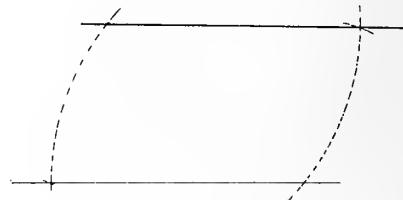
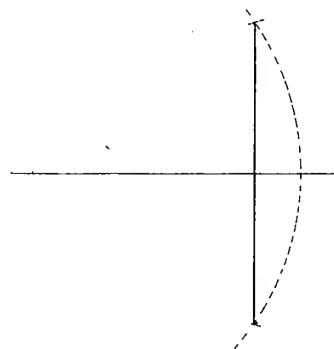
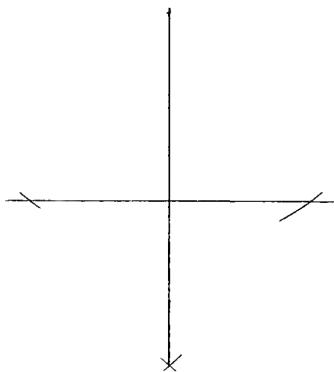
533 W. Erwin Street,  
M. E. 37. TYLER, TEXAS.



PROBLEM 3: To draw a perpendicular to a straight line from a point without it.  
CASE I.

CASE II.

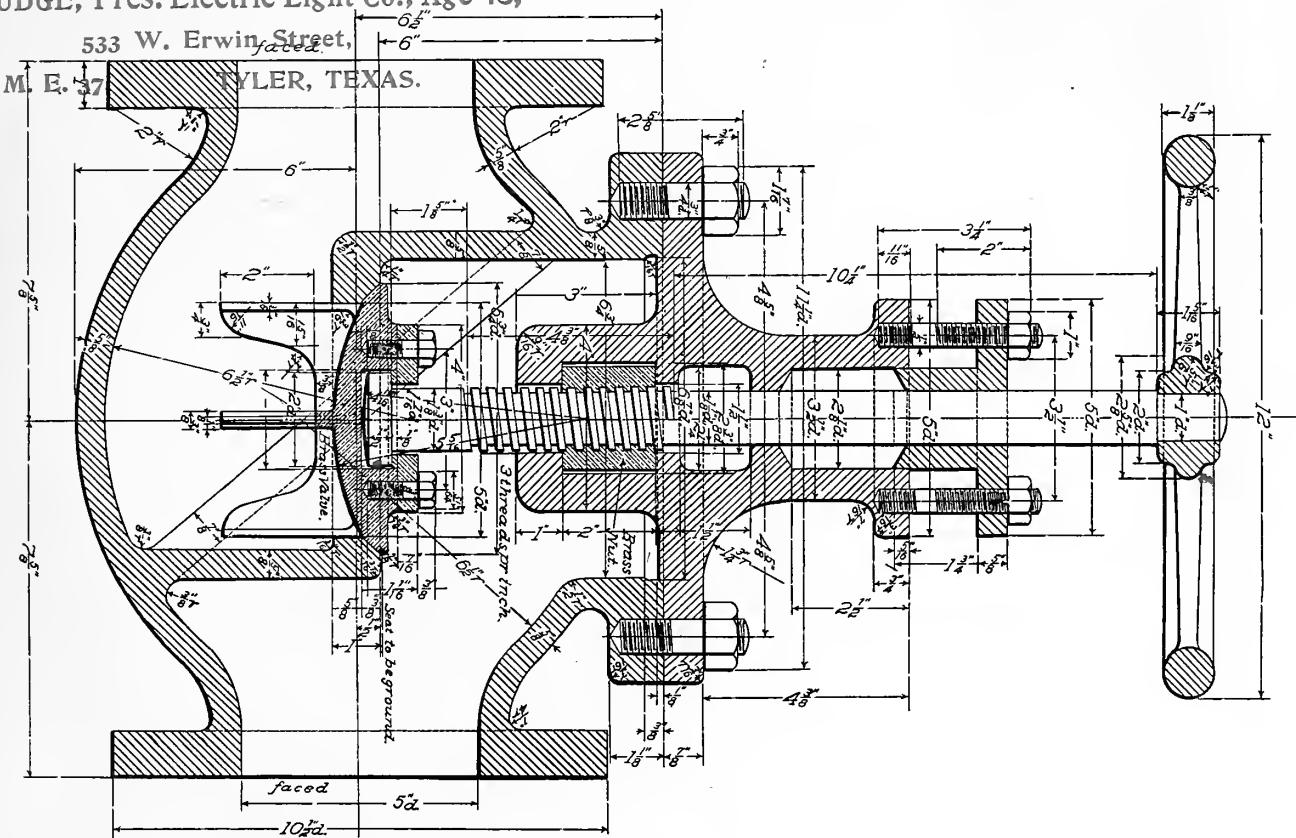
PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line.



Photograph of Plate Drawn by

A. E. JUDGE, Pres. Electric Light Co., Age 45,

533 W. Erwin Street,  
M. E. 37 TYLER, TEXAS.



# 5 INCH GLOBE VALVE.

### Cast Iron.

Half Size.

MAY 20, 1897.

AE. JUDGE, CLASS M.E. 37.





PROBLEM 1: To bisect a straight line.

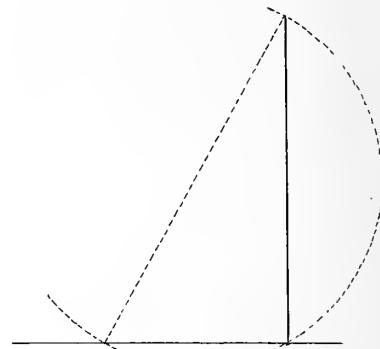
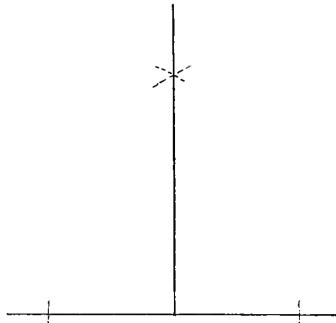
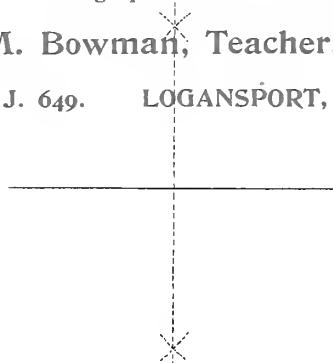
PROBLEM 2: To Draw a perpendicular to a straight line from a given point in that line.  
CASE I.

CASE II

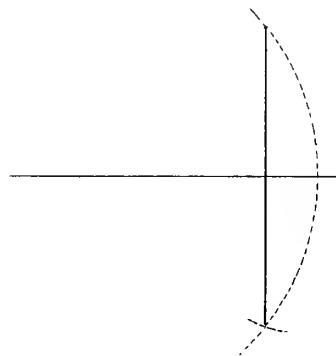
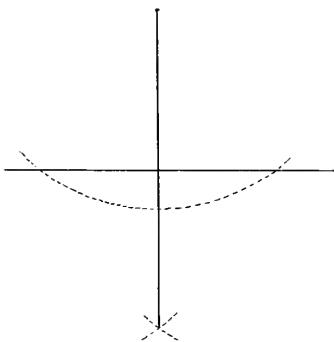
Photograph of Plate Drawn by

F. M. BOWMAN, Teacher, Age 34,

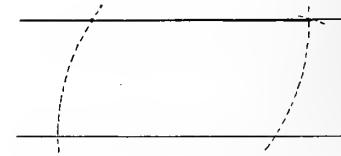
J. 649. LOGANSPORT, IND.

PROBLEM 3: To draw a perpendicular to a straight line from a point without it  
CASE I.

CASE II.

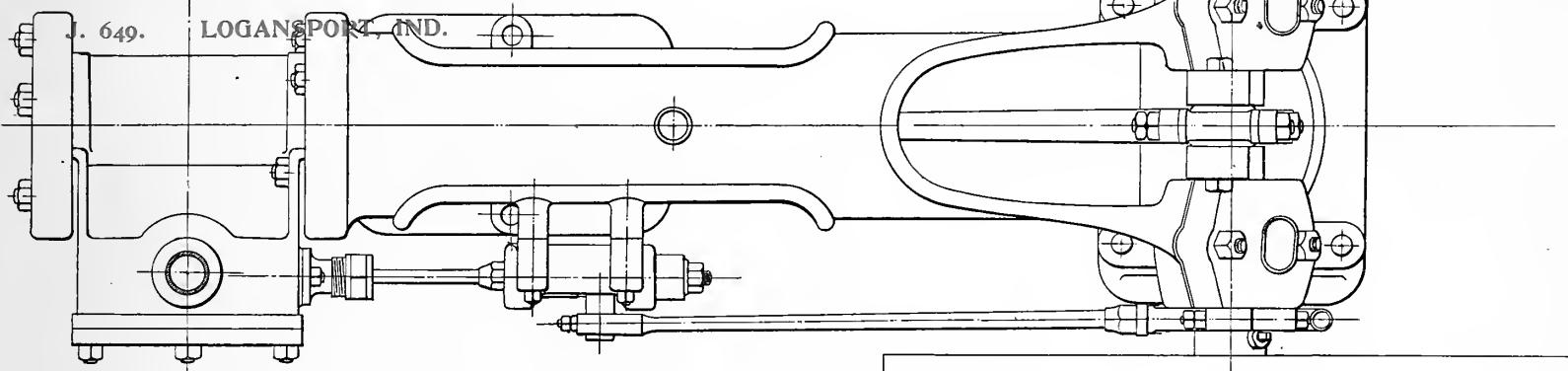


PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line.



Photograph of Plate Drawn by

F. M. Bowman, Teacher, Age 34,



**SIX HORSE POWER  
HORIZONTAL STEAM ENGINE.**

*Scale 5=1ft.*

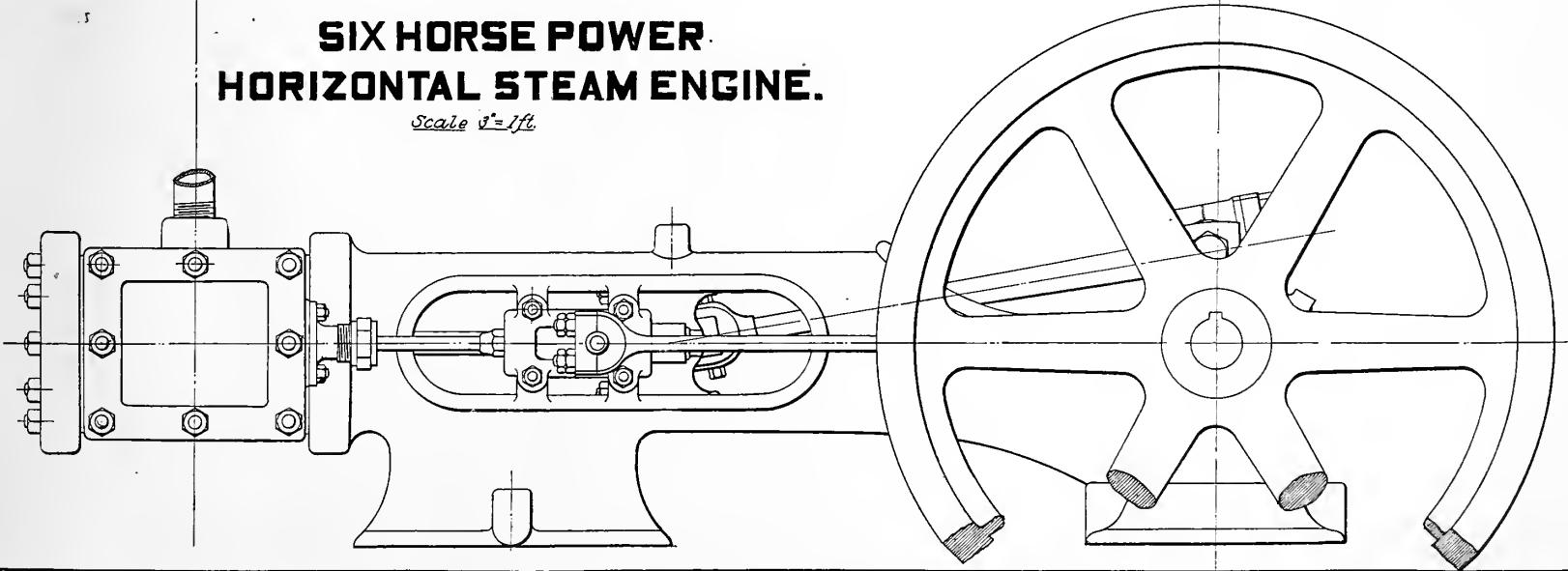






PLATE I.

PROBLEM 1: To bisect a straightline

PROBLEM 2: To draw a perpendicular to a straightline from a given point in that line.  
CASE I.

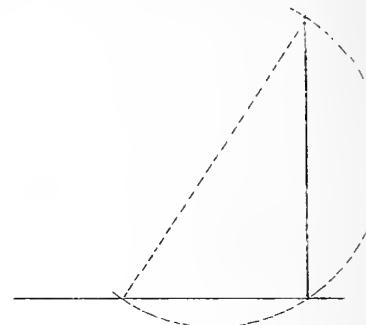
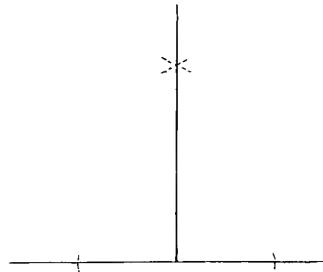
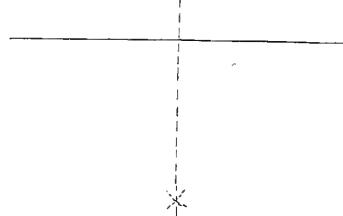
Photograph of Plate Drawn by

Samuel Murray, Fireman, Age 27,

U. S. S. "Oregon," Care of Navy Pay Office,

H. 2044.

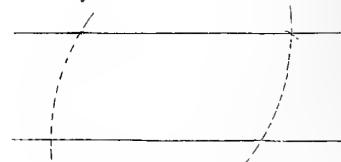
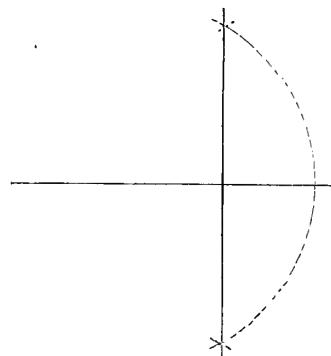
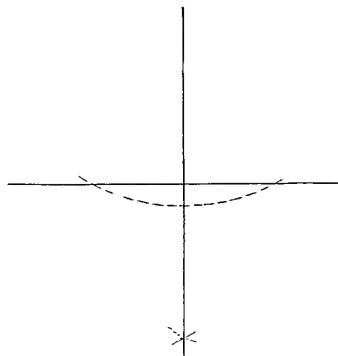
SAN FRANCISCO, CAL.



PROBLEM 3: To draw a perpendicular to a straight line from a point without it  
CASE I.

CASE II.

PROBLEM 4: Through a given point to draw a straight line parallel to a given straight line



## TRIPLE EXPANSION ENGINE.

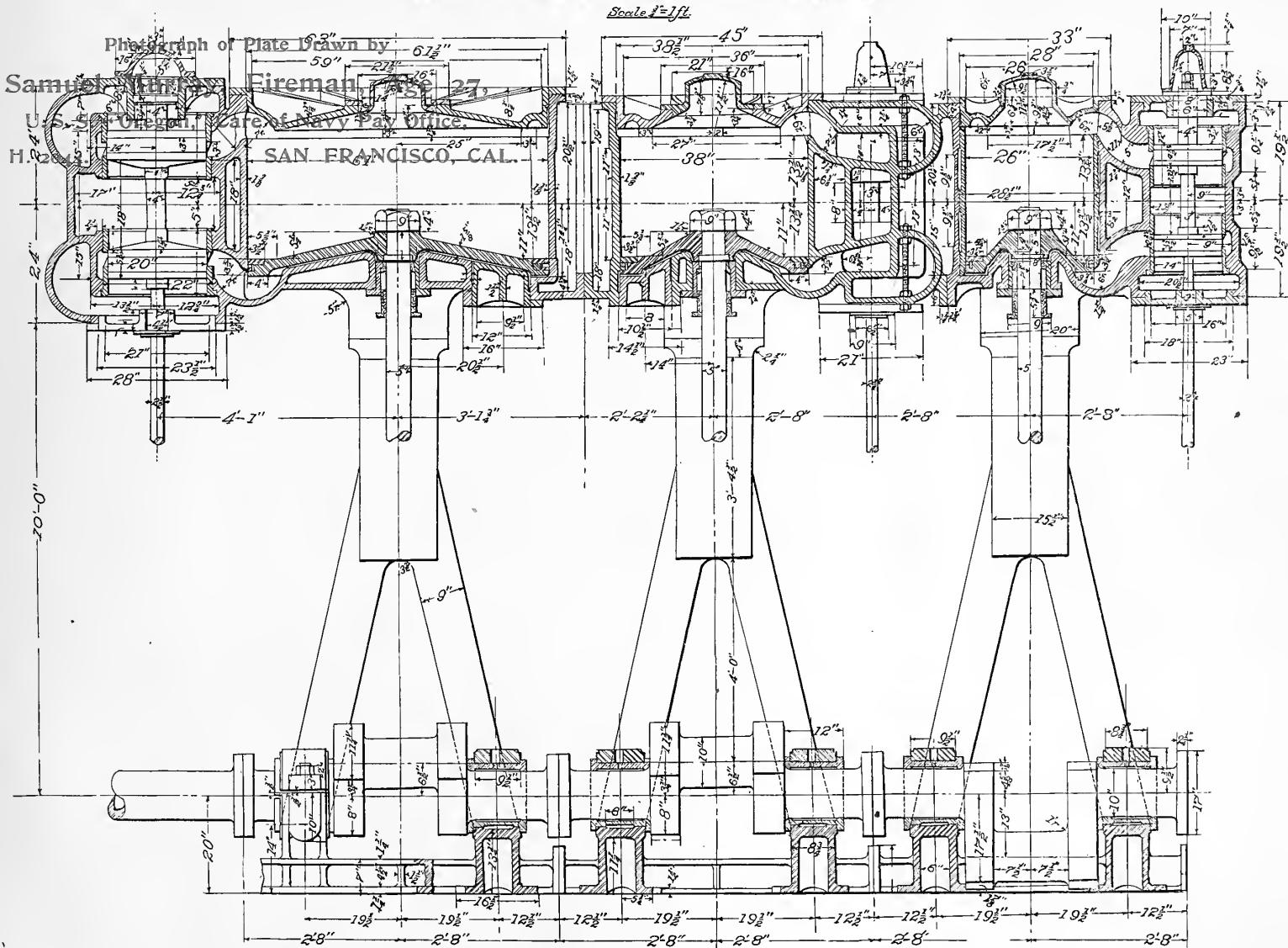
Scale 1"-1 ft.

Photograph of Plate 19<sup>3</sup>" drawn by

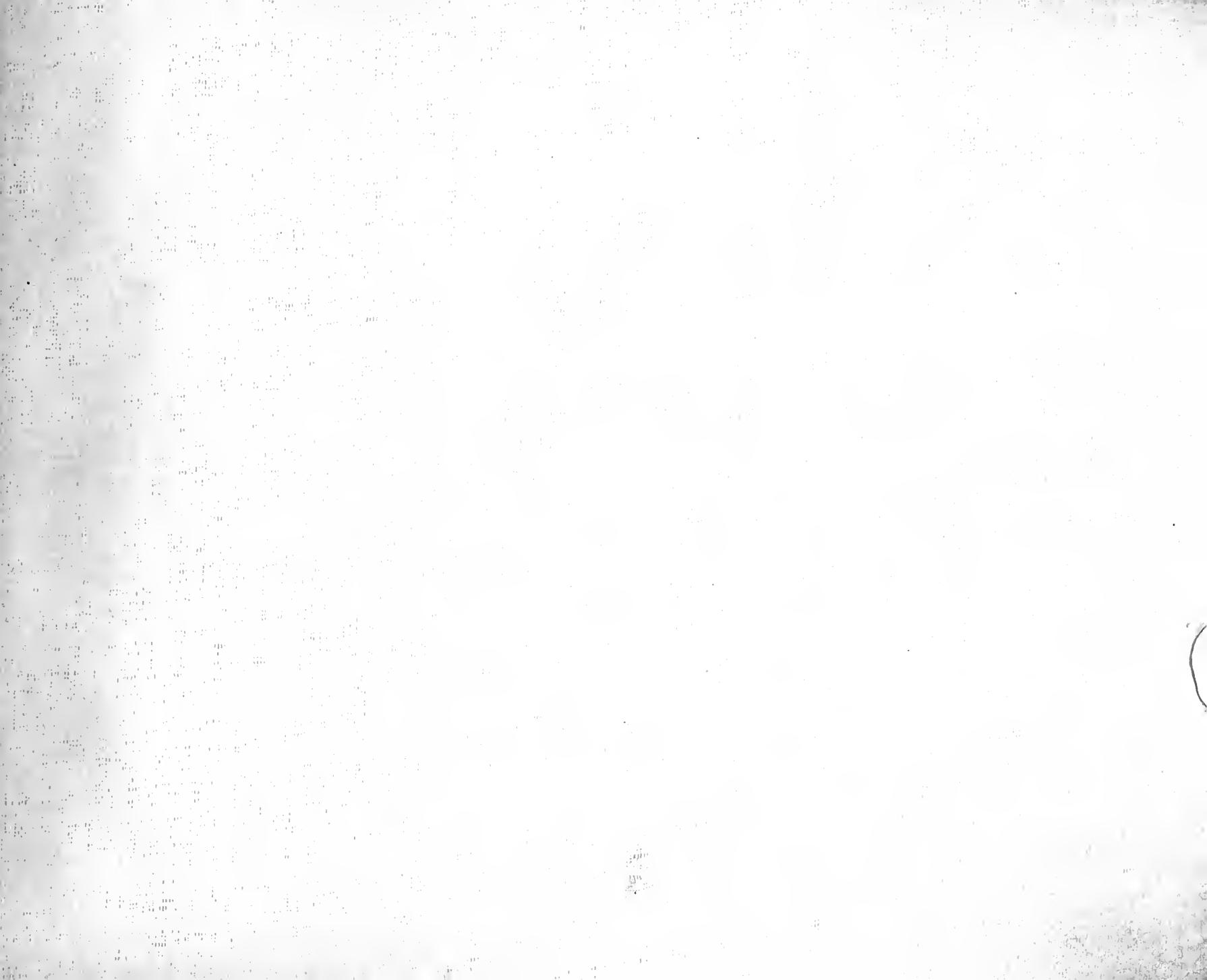
Samuel Murray, Fireman, U.S.A.T. 27,

U.S. Navy Pay Office, Oregon.

H. 20' 0" SAN FRANCISCO, CAL.





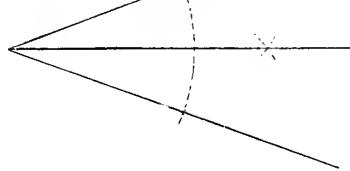


PROBLEMS: To bisect a given angle  
CASE 1.

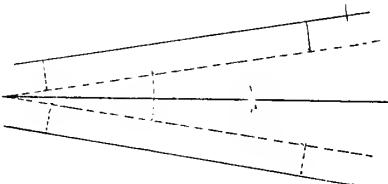
Photograph of Plate Drawn by

J. A. Reed, Marine Engineer, Age 27,

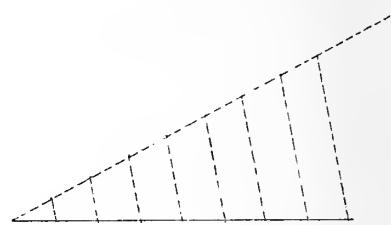
41 Natoma Street,  
H. 761. SAN FRANCISCO, CAL.



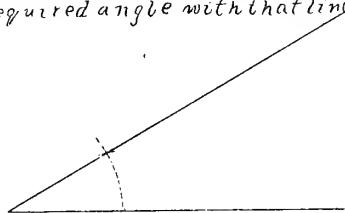
PROBLEM 5: To bisect a given angle



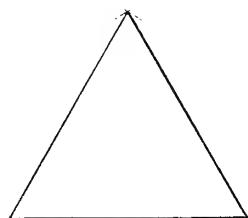
PROBLEM 6: To divide a given straight line into  
any required number of equal parts



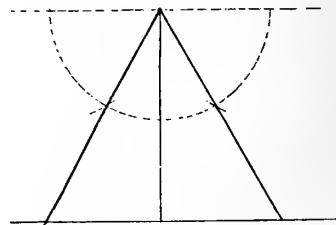
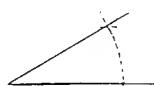
PROBLEM 7: To draw a straight line through any  
given point on a given straight line to make  
any required angle with that line



PROBLEM 8: To draw an equilateral triangle,  
one side being given



PROBLEM 9: The altitude of an equilateral  
triangle being given to draw the triangle





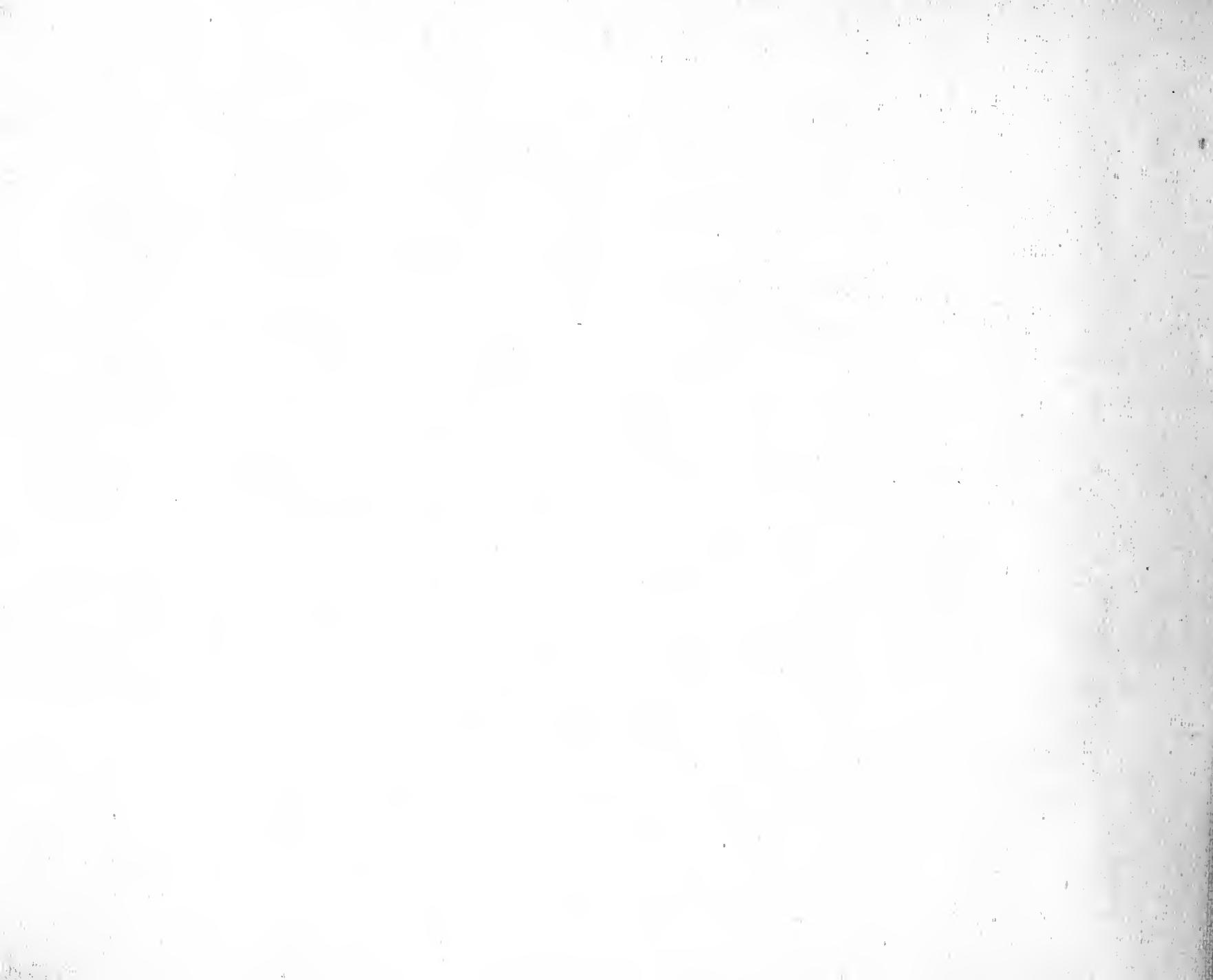




PLATE V.

Problem. 22.— To draw an egg shaped oval.

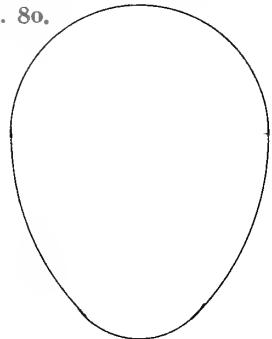
Problem. 23.— To draw an ellipse the diameters being given.

Problem. 24.— To draw an ellipse with circular arcs.

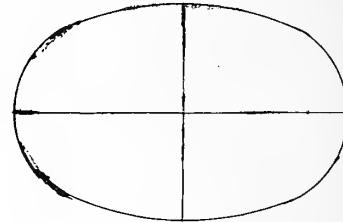
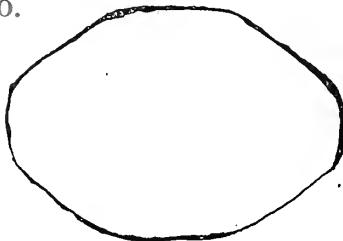
Photograph of Plate Drawn by

R. Hallum, Age 22,  
Hoisting Engineer,

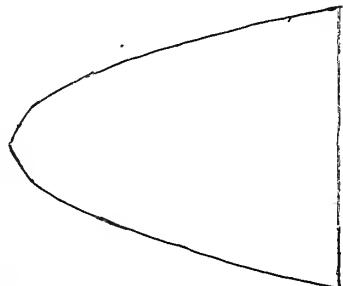
M. 80.



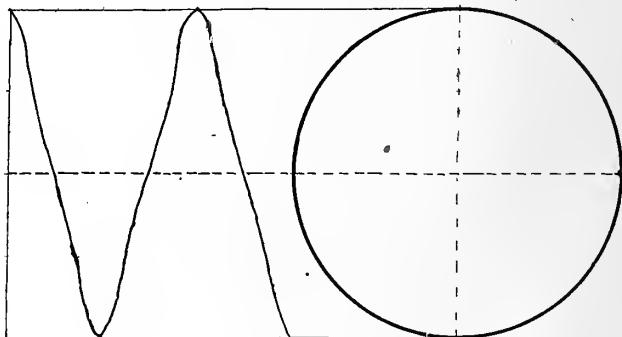
DESLOGE, MO.



Problem. 25.— To draw a parabola the axis and longest double ordinate being given.



Problem. 26.— To draw a neck the pitch and the diameter being given



JAN. 9. 1894.

ROBT. HALLUM. CLASS. NO. 80

PLATE XII.

4'-5" SHEAVE

Scale 3" = 1 ft.

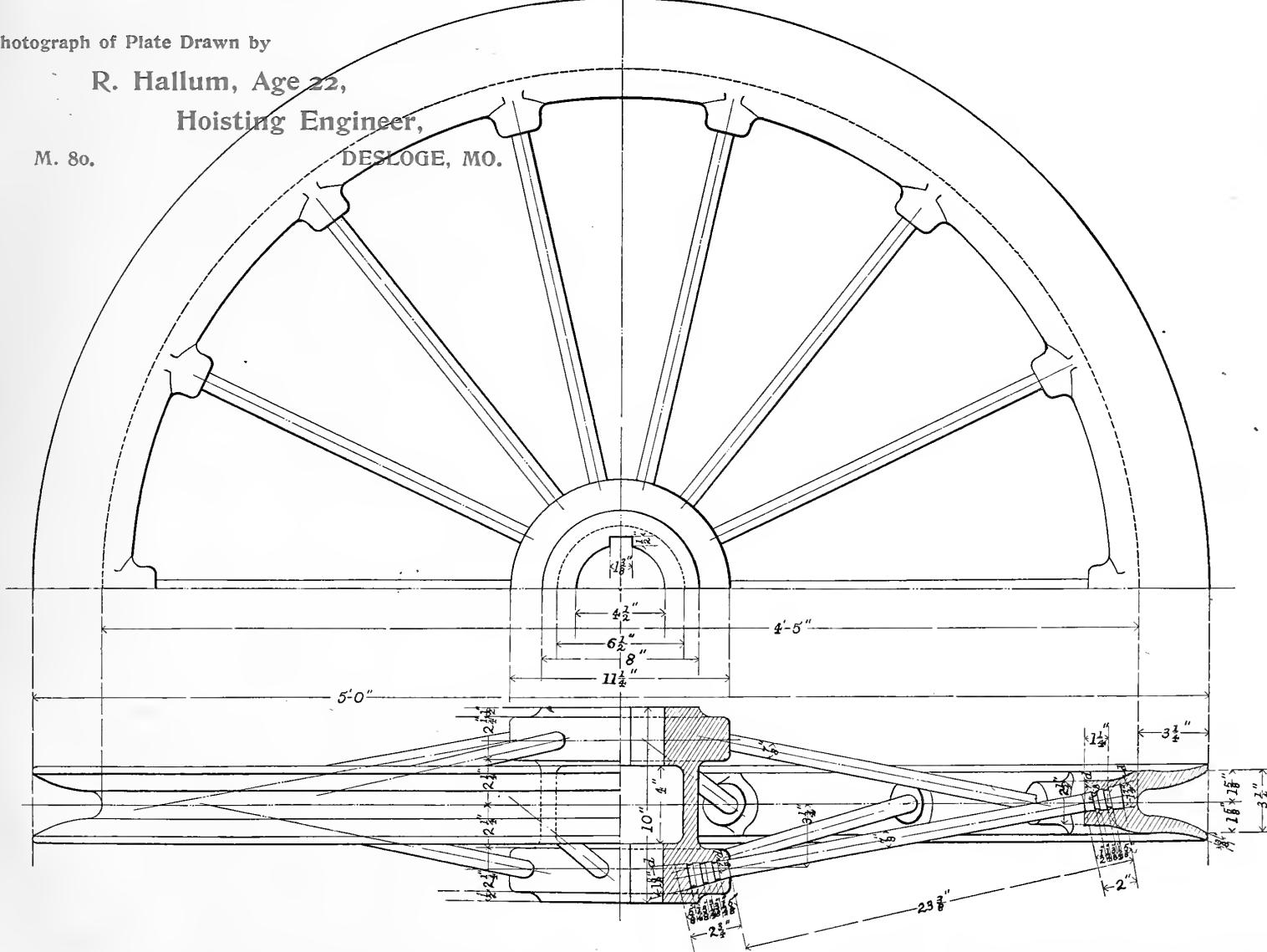
Photograph of Plate Drawn by

R. Hallum, Age 22,

Hoisting Engineer,

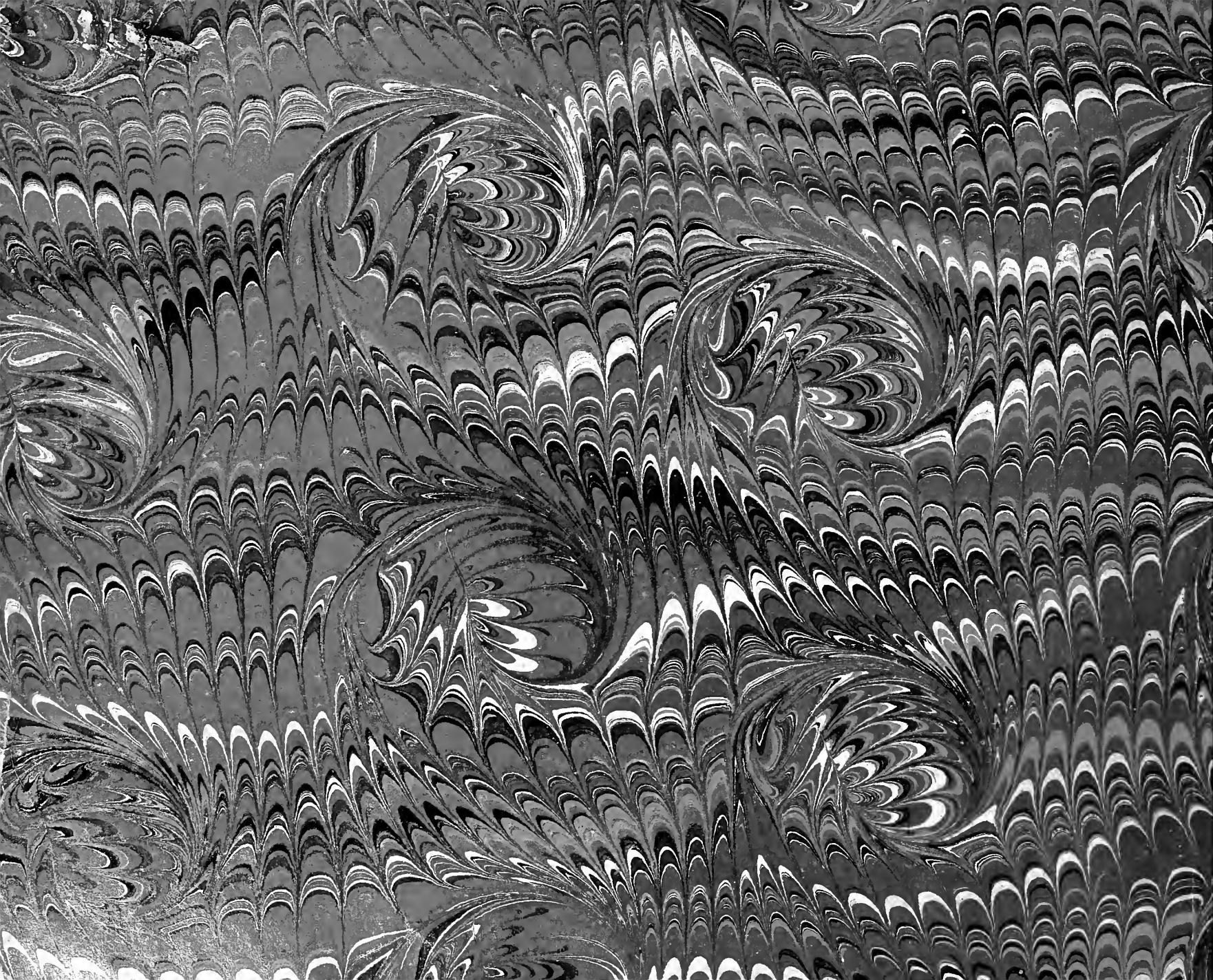
M. 80.

DESLOGE, MO.











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